NJD 002/65561

SDK

REMEDIAL ACTION REPORT ADDENDUM

JULY 1999

Prepared For:

WITCO CORPORATION Perth Amboy, New Jersey

Prepared By:



FOSTER WHEELER ENVIRONMENTAL CORPORATION

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August 4, 1999

Mr. Gary Lipsius
New Jersey Department of Environmental Protection
Division of Responsible Party Management
Bureau of State Case Management
401 East State Street
CN 028
Trenton, NJ 08625

SUBJECT: SUBMITTAL OF REMDIAL ACTION REPORT ADDENDUM, PERTH AMBOY PLANT CLEANUP

Witco has completed all on site clean up activities according to the requirements of the NJDEP as defined in the "Second Stipulation of Settlement" for our Perth Amboy NJ facility. As part of the close out and anticipation of the issuance of the NFA we are submitting the completed RAR Addendum for your review and approval.

Included in this submittal please find the following;

- Submittal certification letter
- (4) copies of the RAR Addendum dated July 1999, topics covered include;

Heater Pad Remediation

Natural Groundwater Remediation

Classification Exception Area

Deed Notice

Appendices and Exhibits

- (1) set unbound copy of the Deed Notice
- (1) set of disks and instructions of Electronic Data
- (1) set of hard copy data submittals

This submittal will arrive to you in 3 boxes.

It is our understanding the Deed Notice needs to be submitted prior to receiving the conditional NFA from the Department. To help you process the deed notice through Department comment, an unbound copy is provided for your use. As soon as you have reviewed the notice, please provide your comments so we may submit to other jurisdictions.

If you have any questions feel free to contact me at 203-552-2408.

Sincegely,

Stephen D. Kohlhase

Witco Corporation

Bcc- CE File 600-597.10.14- 1copy of RAR Addendum, 1 set hard copy data, copy of data cover sheets sent to NJDEP with submittal

M. Pittignano 1copy RAR Addendum

J. Raspa w/o Perth Amboy

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Witco

Witco Corporation Performance Chemicals Group 1000 Convery Boulevard Perth Amboy, NJ 08862 (908) 826-6600 (908) 826-5408 Fax

July 28, 1999

Mr. Gary Lipsius
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Division of Responsible Party Site Management
Bureau of State Case Management
401 East State Street
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Trenton, NJ 08625

SUBJECT: CERTIFICATION OF SUBMITTAL OF REMEDIAL ACTION REPORT WITCO CORPORATION, PERTH AMBOY PLANT CLEANUP

Dear Mr. Lipsius:

In accordance with the requirements for certification of reports per N.J.A.C. 7:26C-1-2, we submit the following, concerning the Remedial Action Report (RAR) dated November 1998, submitted November 6, 1998 for the Perth Amboy on site PCB remediation work.

"I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, to the best of my knowledge, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."



"I certify under penalty of law that I am fully aware of the requirements of N.J.S.A. 58:10B-3 et seq., as they pertain to remediation funding sources. Specifically, I am aware of my responsibilities in the establishment and maintenance of a remediation funding source. Additionally, I acknowledge that this remediation funding source shall be maintained until such time as I have submitted an alternative remediation funding source to the Department and it has been approved by the Department in writing or I have been notified by the Department in writing that I am no longer required to maintain a remediation funding source. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

WITCO-CORBORATION

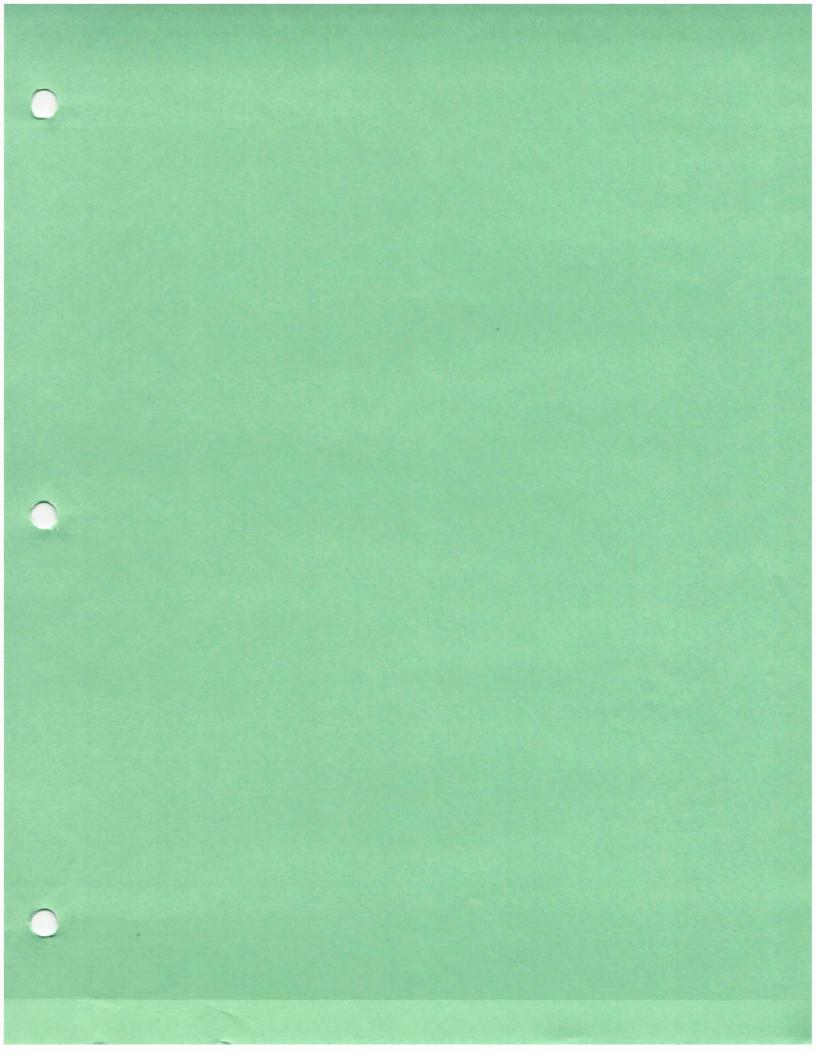
Bv:

Title:

Sincerely,

Richard Lissenden Plant Manager Witco Corporation **NOTARIZATION**

CORINNE FITZSIMMONS NOTARY PUBLIC OF NEW JERSEY My Commission Expires April 15, 2002



REMEDIAL ACTION REPORT ADDENDUM WITCO CORPORATION PERTH AMBOY FACILITY

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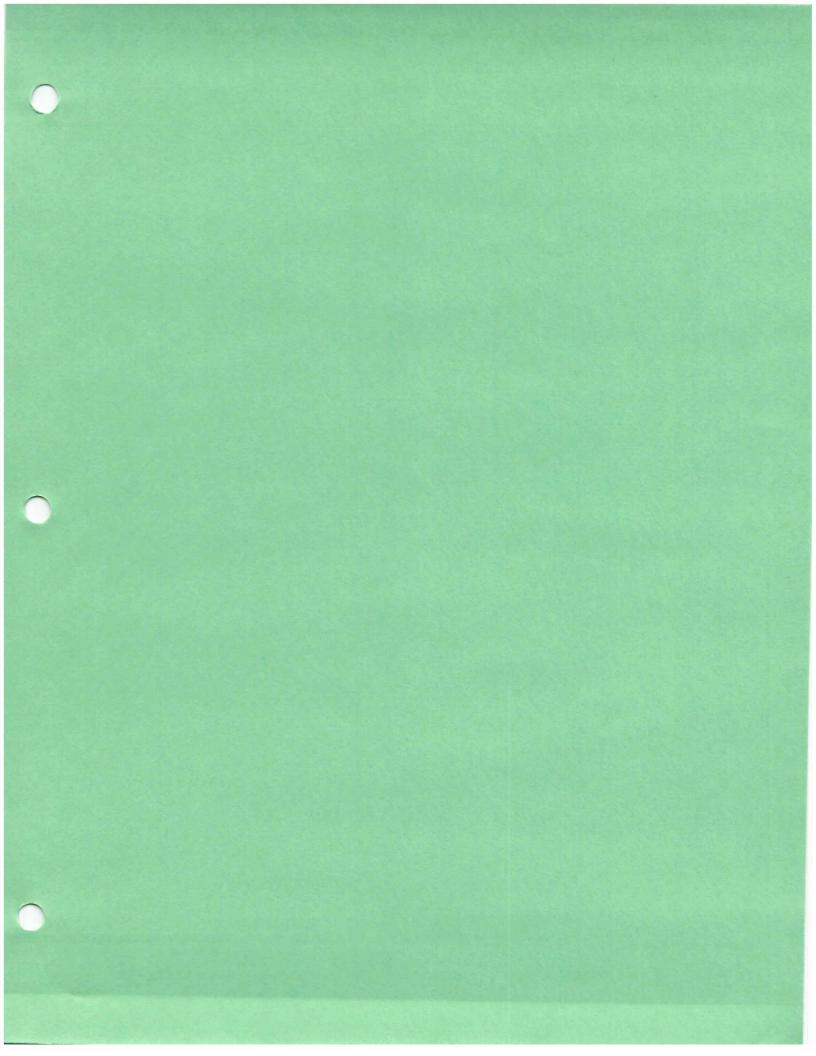
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1.0 INTRODUCTION

This Remedial Action Report (RAR) Addendum has been prepared subsequent to remedial activities conducted at the Witco Corporation (Witco) Plant (the Facility) located in Perth Amboy, New Jersey. This document was prepared in accordance with the requirements of the New Jersey Department of Environmental Protection (NJDEP) as specified in the September 10, 1985 "Stipulation of Settlement" and amended in the "Second Amendment to the Stipulation of Settlement," dated January 12, 1993. This RAR Addendum addresses five major issues:

- 1. Remediation of soil contaminated with polychlorinated biphenyls (PCBs) in the heater pad area;
- 2. Modeling performed to demonstrate natural ground water remediation;
- 3. The establishment of a Classification Exception Area (CEA);
- 4. The filing of a Draft Deed Notice; and
- 5. Demonstration of the applicability of and request for a "No Further Action" determination.

1.1 PURPOSE AND OBJECTIVE

The purpose of the RAR Addendum is to supplement the RAR prepared by Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) in November 1998 with information pertaining to the five major issues identified above. With the information presented in the RAR and this Addendum, Witco has the basis to substantiate a no further action determination for the site. The RAR Addendum is prepared based on previous reports and data regarding the Facility as well as data collected by Foster Wheeler Environmental representatives who provided technical assistance during heater pad area remedial activities.

The objective of the RAR Addendum is to satisfy the requirements of the NJDEP, as defined in the "Second Stipulation of Settlement," dated January 12, 1993. The RAR Addendum has been prepared in accordance with the NJDEP "Technical Requirements for Site Remediation," N.J.A.C. 7:26E-6.6.

1.2 SUMMARY OF PREVIOUS REMEDIAL ACTIONS

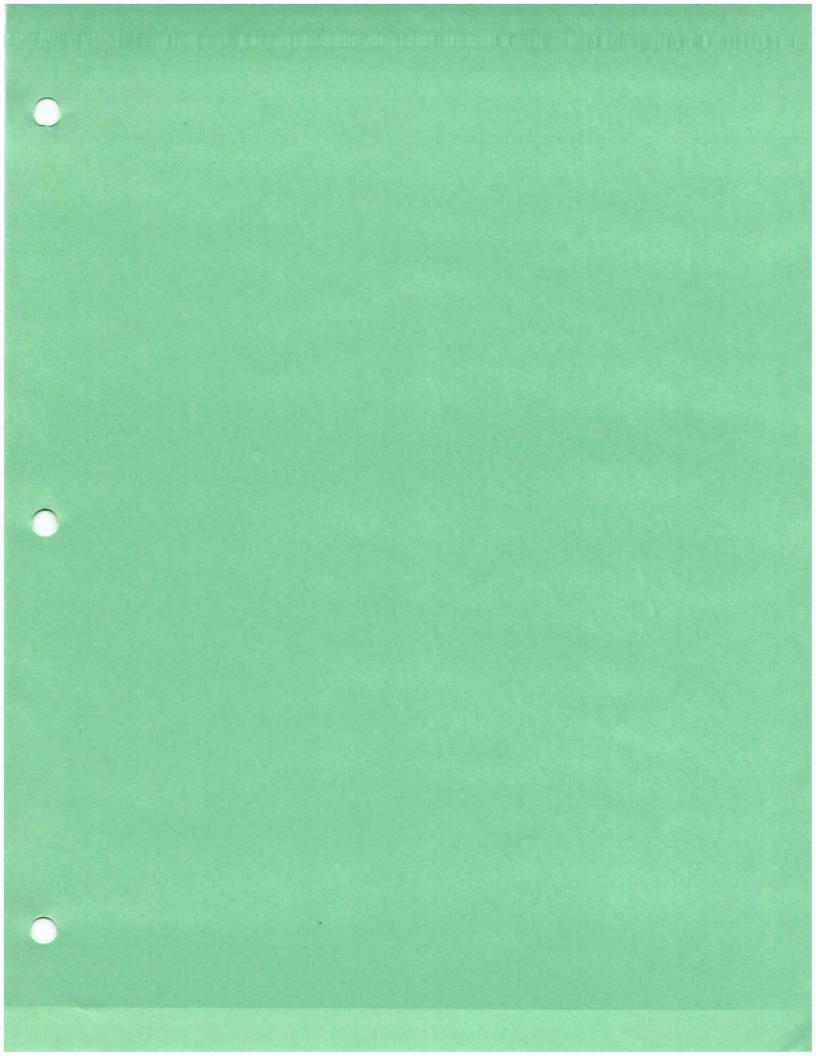
The RAR prepared by Foster Wheeler Environmental in November 1998 provided a detailed description and documentation of the remedial activities conducted at the Facility and introduced the topics to be covered in this RAR Addendum. The RAR discussed the remediation of soils and sediments contaminated by PCBs, the excavation and disposal of buried drums and construction debris, excavation and disposal of soils contaminated with xylene and lead, post-remedial sampling in the fuel tank area, sampling of a tar-like substance seeping from the ground, and the proposed remedial alternative for ground water based on previous investigations and monitoring. The remedial actions documented in Section 4.0 of the RAR were conducted at the site from September 1995 through April 1997. These remedial actions did not include

1

excavation of residual PCBs in the heater pad area due to obstructions created by active process heaters. With the deactivation of certain process heaters, Witco determined that it could complete a remedial action of the remaining PCB-contaminated soils and satisfy remaining NJDEP requirements. The work in the heater pad area was planned and implemented between February 1998 and April 1999.

1.3 REPORT ORGANIZATION

This report is organized into six sections. Section 1.0 – Introduction – presents the purpose and objective of the RAR Addendum and also includes a brief summary of the information contained in the RAR. Section 2.0 - Heater Pad Remediation - provides a detailed description of the remedial actions conducted in the heater pad area of the Facility, including details of field work performed; actual quantities of materials removed; post-excavation sampling data; and a summary of restoration activities. A discussion of previously performed remedial activities is included in the November 1998 RAR prepared by Foster Wheeler Environmental. Section 3.0 -Natural Ground Water Remediation - provides a detailed discussion of natural ground water remediation occurring at the site, including ground water modeling. This discussion includes a presentation of the available data used and assumptions made for modeling purposes, the results of this modeling, and the proposed ground water monitoring program. Classification Exception Area - provides a discussion of the boundaries of the area of concern, the contaminants of concern, the proposed longevity of the CEA, a reference to the ground water monitoring program, and the associated public notice requirements. Section 5.0 - Deed Notice discusses contaminants of concern, areas to be restricted, environmental controls currently in place in these areas, and associated public notice requirements. Section 6.0 - Conclusions presents a brief summary of this RAR Addendum and Witco's substantiation of no further action for the site.



2.0 HEATER PAD REMEDIATION

This section describes the remedial action performed at the Heater Pad Area (HPA) of the Facility. This action was the final portion of the PCB soil remediation that was started in 1983 and concluded in 1997, as discussed in Section 1.2. Remedial activities were performed in accordance with the NJDEP approved Remedial Action Work Plan (RAWP), NJDEP's Technical Requirements for Site Remediation (N.J.A.C. 7:26E), and applicable requirements for the management and transport of contaminated media. The following subsections describe the history, construction, and results of the heater pad remediation project.

2.1 HISTORY

The September 10, 1985 "Stipulation of Settlement" required Witco to remediate PCB-contaminated media present at the Facility. In 1991, the engineering firm of Lawler, Matusky, and Skelly Engineers (LMS) performed a facility-wide Remedial Investigation/Feasibility Study (RI/FS). The RI/FS divided the Facility into five Areas of Concern (AOC) identified by letters A through E. The HPA is located in AOC D, which encompasses 1.5 acres surrounding the Polyester and Drum Filling Buildings. Figure 2-1 shows the location of the HPA and its proximity to the Polyester Building and other process structures. During a previous PCB remediation in AOC D conducted in 1988, contaminated soil was excavated from the area surrounding the hot oil heater pads located between the Polyester Building and Drum Filling Building. Contaminated soil beneath the heater pads could not be excavated at the time due to the on-going use of the hot oil heaters. As part of site restoration activities, a liner was installed in the PCB excavation area and bolted to surrounding concrete pads. Water collection sumps were placed in the lined area and the clean backfill placed in the excavation was covered with a concrete cap. Recently, the hot oil heaters were decommissioned, which allowed Witco to pursue the final remediation of the area.

The objective of the HPA remedial action was to remove accessible PCB-contaminated concrete and soil beneath the three former heater pads (HP) and restore the area with a liner and concrete cap. Figure 2-2 shows the locations of the three pads. The dimensions of HP2, HP3&4 and HP5 were 12 ft. x 25 ft., 24 ft. x 25 ft., and 14 ft. x 25 ft, respectively.

2.2 CONSTRUCTION

Remedial field activities at the HPA were initiated on February 1, 1999, with the mobilization of the necessary personnel, equipment, and materials to complete the task. The tasks associated with the construction phase of the remedial action were:

- Concrete Demolition and Removal
- Soil Excavation
- Liner Placement
- Water Collection System Installation



- Placement and Compaction of Backfill
- Concrete Cap Installation
- Transportation and Disposal

2.2.1 Concrete Demolition and Removal

Concrete demolition and removal occurred from February 2 to February 5. The heater pads, each constructed of reinforced concrete, consisted of a six-inch thick slab with ten-inch high curbing. The heater pads and associated curbing were demolished with an excavator-mounted 3000-lb jackhammer. Prior to the initiation of jackhammering, the concrete surrounding the heater pads was cut with a diamond-tipped saw approximately one foot beyond the edge of the curbing to facilitate removal. After the jackhammering was complete, the concrete rubble was removed from the HPA, stockpiled, and sampled for disposal. Results of the concrete chip sampling are discussed in Section 2.3.

2.2.2 Soil Excavation

The heater pads were located in tight quarters close to the Polyester Building, active storage tanks, and other fixed, crucial structures (see Figure 2-1). The proximity of the heater pads to nearby structures required sloping of the sidewalls for each excavation during soil removal. A 1:1 slope was maintained along the sidewalls and a 1:2 slope was maintained along the Polyester Building foundation. During preparation of the RAWP, USEPA and NJDEP were notified that the use of sloping would limit the ability to remove residual PCB-contaminated soil beyond excavation depths imposed by sloping requirements. On May 9, 1998, Witco received a letter from USEPA agreeing with the intended use of sloping, stating that identified activities would comply with federal PCB regulations, 40 C.F.R. Part 761. Witco included the USEPA letter in the NJDEP-approved RAWP and it is provided in Appendix A as Exhibit A-1 for reference.

Soil excavation was conducted from February 9 to February 11, 1999. Soil was excavated with a track-mounted excavator. Hand excavation was required in some locations, such as along the top of the building foundation. Excavation continued until target depths were reached or until the slopes of sidewalls were met.

According o the NJDEP-approved RAWP, the excavations for HP3&4 and HP5 were to be separate excavations; however, due to the confines of the area, it was determined that it would be more efficient to combine the two excavations into one. By combining the two excavations, the remediation effectively removed a larger volume of soil with PCB concentrations above action levels.

The general stratigraphy observed during excavation was:

- Concrete
- Dark Reddish Brown Silty Sand (apparent fill)
- Gray Silty Clay

Gray Clay

Upon completion of excavation, post-excavation samples were collected. Discussion of the collection and results of the soil samples can be found in Section 2.3. Figure 2-2 shows the final excavation limits, spot elevations, and the locations of the post-excavation samples.

Excavated soil was removed from the HPA, stockpiled on plastic sheeting, and sampled for disposal characterization. Disposal characterization sampling and analysis are discussed in Section 2.3.

2.2.3 Liner Placement

After post-excavation samples were collected, a 40-mil PVC liner was placed in each excavation. Prior to liner placement, the excavation was cleared of concrete, cobbles or metal rebar that could puncture the liner. Clean backfill was used to contour the excavation bottom and sidewalls to provide a smooth continuous base for the liner. The liner was rolled out across the excavation and allowed to overlay the existing liner installed after the 1988 remedial action in the HPA.

2.2.4 Water Collection System Installation

After the liner was in place, a water collection system was installed on top of the liner at the base of the excavation. The system was constructed primarily of 8-inch perforated, schedule 40 PVC. Slip-joint couplings, glued together with PVC cement, were used to assemble the system. The system consisted of one to two lengths of perforated pipe laid horizontally on the liner, connected to a "T", in which a vertical standpipe was also connected.

In the HP3&4/HP5 excavation, 26 feet (20 foot length coupled with 6 foot length) of perforated pipe extended from one side (south) of the "T" while 20 feet extended from the other side. The water collection system in HP2 consisted of one length (20 feet) of perforated pipe connected to the south side of the "T".

The water collection system was installed in the following manner: Pea gravel was placed at the bottom of the excavation on top of the liner. The perforated PVC pipe was wrapped in geotextile fabric and placed on top of the gravel. An additional six-inch layer of pea gravel was then placed over the pipe. Geotextile fabric was placed over the gravel to prevent fine particle materials from entering the gravel layer. The standpipe was then connected to the perforated pipe via the "T". The standpipe will allow access to the system from the ground surface for the removal of water on an as-needed basis according to periodic inspections by plant personnel.

2.2.5 Backfilling

Environmentally clean backfill, with minimal organic matter, wood, trash or rubble, was used to fill the lined excavation above the water collection system. The backfill was also used to contour the excavation prior to liner placement. The backfill was from an off-site source. Analytical



results, both chemical and geotechnical, of the backfill sampling are included in Appendix A as Exhibit A-2. The backfill was placed in the excavation in 18-inch lifts and compacted to a minimum 85 percent Proctor density. Compaction tests were performed throughout backfilling utilizing a nuclear density meter. If a specific area failed the test, it was re-compacted. Backfill was extended to within eight inches of the existing concrete grade.

2.2.6 Concrete Cap

The remaining space between the top of the backfill and the existing concrete grade was filled with concrete. An eight-inch thick, reinforced concrete cap was poured to complete the work. Reinforcement mesh was used. A bentonite water seal was placed in the joints between the existing and new concrete. The vertical PVC pipes connected to the water collection system were finished flush with the concrete and typical well covers were placed to protect the pipes and prevent infiltration of precipitation.

2.3 **RESULTS**

The following section summarizes the results of the Heater Pad Remediation.

2.3.1 Post-Excavation Sampling

After practical excavation limits were reached, post-excavation sampling for PCBs was According to the NJDEP-approved RAWP, there were to be three separate excavations (HP2, HP3&4 and HP5). However, as discussed in the previous section, excavations HP3&4 and HP5 were combined into one excavation.

Post-excavation samples were collected from 0 to 6 inches from both sidewalls and from the bottoms of the two excavations. Sample locations were biased towards areas of apparent Where possible, soil for the samples was collected at the location directly with decontaminated stainless steel trowels. Due to health and safety restrictions placed on entry into the excavation, some soil was collected with the excavator bucket. When this was the case, soil was collected from the center of the bucket from a portion of the soil that had not come in contact with the bucket.

Collected soil was screened with a flame ionization detector (FID) for real-time volatile organic compound (VOC) measurements. If elevated VOC readings were detected, a soil sample was collected for VOC analysis. Table 2-1 presents the FID and post-excavation analytical results. As can be seen from the table, elevated readings were not detected.

Collected soil was placed in a decontaminated stainless steel bowl, homogenized, and transferred into an appropriate sample container. The samples were then placed in a cooler with ice and shipped to an off-site laboratory. A chain of custody form accompanied the sample shipment. STL Envirotech, a NJDEP certified laboratory, performed the sample analyses. Envirotech data package is included in Appendix A as Exhibit A-3.

Pertinent information such as the soil description, VOC readings, and sample collection times were recorded in a bound field notebook.

Figure 2-2 depicts the post-excavation survey of the two heater pad remediation areas with spot elevations and sampling results noted. Six post-excavation soil samples were collected from the HP2 excavation and 11 post-excavation soil samples were collected from the HP3&4/HP5 excavation for PCB analysis by Method 8082. Aroclor 1248 was detected in 16 of the 17 post-excavation samples. Aroclor 1242 was detected in one sample. Total PCB concentrations for the samples from HP2 ranged from 7.1 mg/kg to 900 mg/kg, while results from HP3&4/HP5 PCB concentrations ranged from 0.088 mg/kg to 2,900 mg/kg. Table 2-1 presents the individual sample results. All samples from HP2 except one exceeded 50 ppm. In the HP3&4/HP5 excavation, only two samples exceeded 50 ppm.

The soil sampled was generally gray clay. The higher PCB concentrations appeared to be associated with staining observed in sections of the clay.

2.3.2 Transportation and Disposal of Contaminated Materials

Concrete rubble and excavated soil were shipped off-site by a licensed waste transporter. The contaminated material was disposed at the Model City disposal facility in Buffalo, New York. All waste materials were disposed as TSCA-regulated wastes based on disposal characterization analyses. Completed and signed manifests for this waste are included in Appendix A as Exhibit A-4.

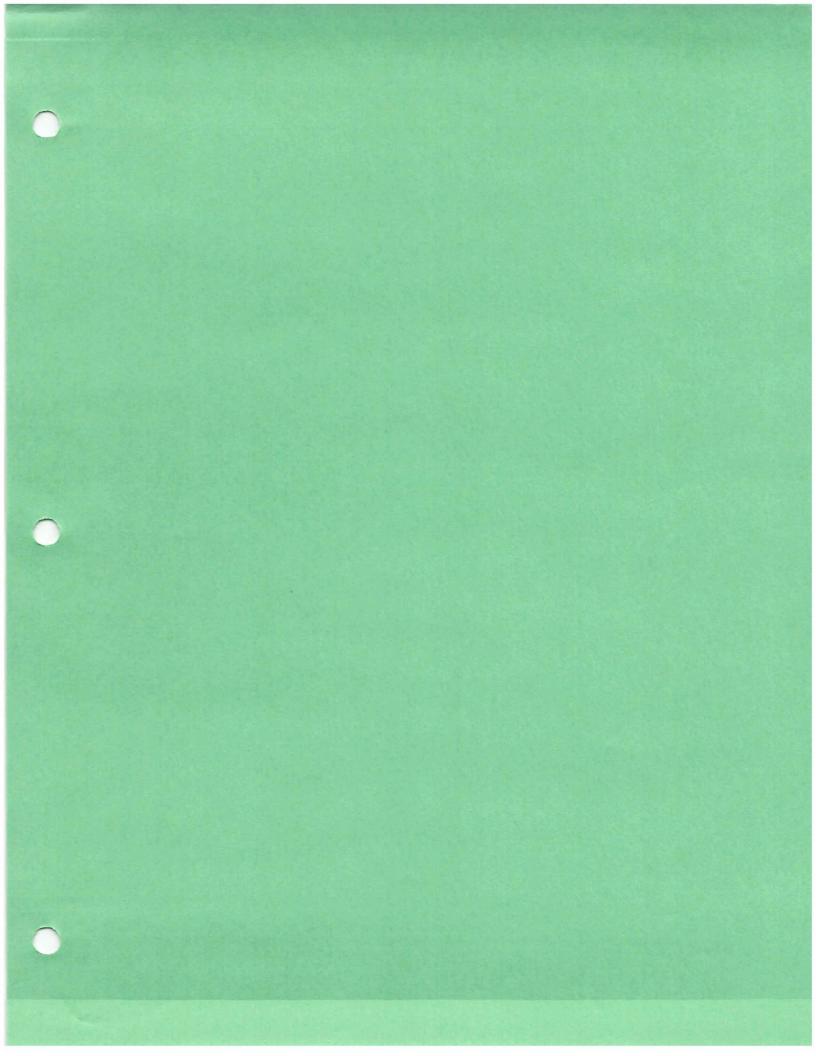
Prior to shipping, chip samples were collected from the concrete and soil samples were collected from the excavated soil stockpiles. Two concrete chip samples were collected, one from the concrete rubble from heater pad HP2 and another from the rubble from heater pads HP3&4/HP5. The results for the two samples are included in Appendix A as Exhibit A-5.

Excavated soil was also sampled to determine PCB content for disposal purposes. Two samples of the stockpiled soil were collected and analyzed for PCBs, one from HP2 soils and one from HP3&4/HP5 soils. The results for the two samples are included in Appendix A as exhibit A-6.

2.4 CONCLUSIONS

The Heater Pad Remediation was performed according to the NJDEP-approved RAWP and relevant NJDEP and TSCA regulations.

As anticipated in the RAWP and approved by USEPA, soils with PCB concentrations in excess of soil cleanup criteria remain in the HPA. These soils are addressed in the deed notice that is being established for sections of the Facility. After the deed notice is in place, no further action is necessary for the HPA.



3.0 NATURAL GROUND WATER REMEDIATION

3.1 OVERVIEW

The remedial activities described in the RAR and Section 2.0 of this Addendum removed significant contaminant mass from the Facility's subsurface soils. As part of the LMS RI/FS, several monitoring wells were installed throughout the Facility and Witco has used these wells to conduct semi-annual ground water monitoring in accordance with NJDEP requirements. Historic monitoring has detected the presence of contaminants in ground water at the Facility. Since sources have been removed, ground water constituent concentrations have declined and are approaching or are below applicable NJDEP criteria. The following are the current NJDEP Ground Water and Surface Water Quality Criteria (N.J.A.C. 7:9-6) for the contaminants found in monitoring wells at the Facility:

| CONTAMINANT | TABLE 1 OF N.J.A.C. 7:9-6 GROUND WATER QUALITY STANDARDS (ug/I) | N.J.A.C. 7:9-B SURFACE WATER QUALITY STANDARDS (ug/l) |
|------------------------|---|---|
| Methylene Chloride | 2 | 2.49 |
| 1,1-Dichloroethane | 70 | 4.81 |
| Cis- 1,2-dichlorethene | 10 | No standard |
| Trichloroethene | 1 | 1.09 |
| Benzene | 1 | 0.15 |
| Toluene | 1000 | 6800 |
| Ethylbenzene | 700 | 3030 |
| Xylene | 1000 | No standard |

Results of historic monitoring indicate that ground water contaminants have been decreasing substantially and are not migrating off-site, as indicated by downgradient well and surface water sampling, to potential human or environmental receptors. Based on background and historic data, and the physiographical, geological and hydrological nature of the site, residual contaminant concentrations in ground water may be addressed through natural remediation. This section provides an assessment of natural ground water remediation as a viable remedy for remaining ground water contaminants.

Natural attenuation processes that effect contaminant concentrations/mass are:

- Biodegradation
- Dispersion
- Dilution
- Sorption
- Volatilization
- Chemical or biological stabilization

In assessing a site for the likelihood of a natural ground water remediation, three key factors are evaluated. The three key factors, in descending order of importance, are:

- 1. Historic groundwater contaminant trend data
- 2. Geochemical natural attenuation parameter data; and
- 3. Microcosm studies

At Witco's Facility, the historic groundwater data clearly demonstrates a dramatic decrease in contaminant mass over time. This data trend indicates natural attenuation is occurring at the Facility. Section 3.2 discusses these trend data in greater detail. In addition to the trend data, Witco has collected natural attenuation parameter data in a recent ground water sampling round (January 1999) to further demonstrate that natural attenuation is occurring.

In conjunction with the natural ground water remediation, Witco will establish a Classification Exception Area (CEA), consistent with NJDEP policy for the contaminated ground water, to document groundwater exceedances at the Facility. The CEA will be in effect until such time as the ground water quality standards are achieved.

For a complete summary of historic ground water data, refer to Section 5.0 of the RAR.

3.2 HISTORIC GROUNDWATER TREND DATA

The Facility ground water monitoring program has produced four years of historic groundwater contaminant data. Four monitoring wells, MW-1S, MW-6S, MW-11S and MW-14P, have exhibited volatile organic ground water contamination in excess of standards in the most recent round in which these parameters were measured (June 1998). MW-1S and MW-14P have exhibited chlorinated solvents. MW-1S has exhibited elevated levels of TCE (280 ug/l in June 1998) and associated breakdown products 1,1-DCE (10 ug/l in June 1998) and cis-1,2-DCE (11 ug/l), while MW-14P has exhibited concentrations of TCE just above the 1 ug/l criterion (1.1 ug/l in June 1998). MW-6S and MW-11S have exceeded standards for benzene (6.3 ug/l in MW-6S, June 1998) and BTEX (4,365 ug/l in MW-11S, June 1998), respectively. Appendix B contains figures from the RAR that present the trends of these specific contaminants. Further discussion of these trends is presented below.

Figures 5-3 and 5-4 show the trends in MW-1S for TCE/Total VOCs and 1,1-DCE/cis-1,2-DCE, respectively. As can be seen from the figures, the concentrations of these compounds are decreasing with time. With respect to TCE and cis-1,2-DCE, the concentrations are decreasing dramatically, as evidenced by the steep slope to the curve. The TCE concentration has decreased by 70% during the period from June 1995 to June 1998. The cis-1,2-DCE concentration trend figure shows that the concentration of cis-1,2-DCE in MW-1S had met the 10 ug/l criteria as of June 1998.

Figure 5-6 shows the trend for benzene concentrations in MW-6S. This trend also shows a substantial decrease of contaminant concentration over time. From June 1996 to June 1998, there has been a 60% decrease in the benzene concentration in the well.

Since the remedial action in the area of MW-11S, concentrations of benzene and ethylbenzene in groundwater samples have decreased over time. Concentrations of xylenes have increased slightly since the remediation, but have decreased significantly over the four years of monitoring (from 7,100 ug/l in June 1995 to 3,500 ug/l in June 1998, a 51% reduction). Figures 5-8 to 5-10 show the trends for these contaminants. Reductions in toluene, ethylbenzene, and naphthalene have been realized; comparison of the contaminant concentrations against individual Groundwater Quality Standards reinforces the benefits obtained from site remediation. Toluene concentrations in MW-11S have not exceeded 1,000 ug/l in the four years of sampling, the concentration of ethylbenzene (610 ug/l) dropped below 700 ug/l in June 1998, and the concentration of naphthalene (290 ug/l) in June 1998 was detected below the 300 ug/l Interim Specific Groundwater Criterion. Total VOCs in MW-11S groundwater have decreased from a high of 16,956 ug/l in June 1996 to a low of 9,664 ug/l in June 1998 (last round in which VOCs were sampled).

The trends in all the wells discussed above show that contaminant concentrations in ground water are decreasing over time. Some of the trends show substantial decreases over time. With the completion of source removal and in the absence of an active groundwater restoration program (i.e., pump & treat, SVE, air sparging, etc.), these decreases in contaminant concentrations are due to natural attenuation processes mentioned at the beginning of this section and described in greater detail in the following sections. The concentrations of the compounds, found in site monitoring wells above groundwater standards, will continue to decrease due to these processes. The rate at which these compounds decrease will be monitored through the ground water monitoring program which is discussed in Section 3.7.

3.3 RESULTS OF ADDITIONAL PARAMETERS SAMPLING

In January 1999, additional analyses were added to the semi-annual ground water monitoring program to assess natural ground water remediation factors. The list of analyses below was added to the ground water monitoring program and the results are shown in Table 3-1. Another round of these parameters was collected in the June 1999 round of sampling and will be reported with the Annual Groundwater Monitoring Report in October 1999.

The additional parameters analyzed are:

| Dissolved Oxygen (DO) | Alkalinity | Hydrogen | Methane |
|--------------------------------------|------------|----------|--------------|
| Oxidation-Reduction Potential (ORP) | Nitrate | Chloride | Ethane |
| Dissolved Total Organic Carbon (TOC) | Sulfate | Ethylene | Ferrous Iron |

The following are potential causes for the trends that may be observed in concentrations of the various natural attenuation indicator parameters sampled in the January 1999 round:

- Dissolved Oxygen: A reduced level of dissolved oxygen in a well where volatile
 organics are present as compared to normal uncontaminated ground water conditions
 (background well) may indicate the presence of aerobic biodegradation.
- Oxidation-Reduction Potential: The oxidation-reduction potential is a measure of the electron exchange potential in the ground water. If oxidation/reduction is due to 1) the reduction of sulfate and iron and 2) the oxidation of organic compounds, then the oxidation-reduction potential will decrease.
- **Dissolved Total Organic Carbon:** An increase in the concentration of total organic carbon in the aquifer where biodegradation is occurring is the result of the oxidation of organic compounds.
- **Hydrogen:** An increase in the concentration of hydrogen in the aquifer where biodegradation is occurring is the result of the oxidation of organic compounds.
- Ethylene and Ethane: The presence of Ethylene and Ethane may indicate the reductive dechlorination of chlorinated hydrocarbons.
- **Alkalinity:** An elevated alkalinity is the result of excess CO₂, which may indicate the oxidation of organic compounds to CO₂ and H₂O.
- Nitrate: A decrease in the concentration of nitrogen in a contaminated well as compared to background levels (the compliance well) may indicate the oxidation of organic compounds resulting from denitrification.
- Sulfate: A decrease in the concentration of sulfate may indicate the reduction of sulfate as the result of the oxidation of organic compounds.
- **Chloride:** An elevated concentration of chloride may indicate reductive dechlorination of chlorinated hydrocarbons.
- **Ferrous Iron:** An increase in the concentration of ferrous iron may indicate the reduction of iron as the result of the oxidation of organic compounds.
- **Methane:** The presence of methane may indicate the oxidation of organic compounds resulting from methanogenesis.

The trends will be established based on future rounds of ground water data for selected natural ground water remediation parameters. If causes for the declining trends in ground water contaminant concentrations cannot be linked to these parameters, other factors may be at work in the subsurface to facilitate natural remediation. The other natural attenuation factors that may account for decreasing contaminant trends include dispersion, dilution, and sorption.

3.4 NATURAL REMEDIATION MODELING

The migration and biodegradation of non-chlorinated organic compounds in ground water can be estimated using BIOSCREEN, a screening model used to approximate plume degradation and movement. The model is designed to simulate biodegradation by both aerobic and anaerobic reactions. It was developed for the Air Force Center for Environmental Excellence (AFCEE) Technology Transfer Division at Brooks Air Force Base by Ground Water Services, Inc., Houston, Texas. Collected natural remediation parameters have been used in the model to estimate plume behavior.

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Chlorinated compounds found at MW-1S and MW-14P cannot be modeled using BIOSCREEN. Instead, the role of active dechlorination can be assessed based on natural remediation parameters and potential future degradation can be examined based on data collected since source removal activities.

3.4.1 BIOSCREEN Model

3.4.1.1 Model Description

BIOSCREEN is a screening model that simulates remediation through natural attenuation of dissolved hydrocarbons. The software, based on the Domenico analytical solute transport model, has the ability to simulate advection, dispersion, adsorption, and aerobic decay as well as anaerobic reactions that have been shown to be the dominant biodegradation processes of dissolved hydrocarbons. BIOSCREEN includes three different model types:

- 1) Solute transport without decay,
- 2) Solute transport with biodegradation modeled as a first order decay process (simple, lumpedparameter approach),
- 3) Solute transport with biodegradation modeled as an "instantaneous" biodegradation reaction (approach used by BIOPLUME models).

3.4.1.2 Model Parameter Selection

The modeling parameters used were either directly measured, calculated from site data, estimated, or were commonly used values as cited in the BIOSCREEN documentation.

Natural attenuation parameters were collected during the January 1999 ground water monitoring round for one background well (MW-12S), four contaminated wells (MW-1S, MW-6S, MW-11S & MW-14P) and one sidegradient or fringe (MW-8S) monitoring well. These data, along with the previous ground water quality data, were used to estimate the extent of biodegradation occurring at the site.

The following sections present the rationale for selecting model parameters. The sections are divided based on the fields appearing in the model display (refer to Appendix B for model output).

3.4.1.2.1 **Hydrogeology Parameters**

The ground water seepage velocity (7.3 ft/yr) was calculated by BIOSCREEN based on three other parameters: hydraulic conductivity, hydraulic gradient, and porosity. The site hydraulic conductivity was measured during the LMS RI/FS using slug tests. The hydraulic conductivity

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calculated for the Woodbridge Member ranged over three orders of magnitude, from 6.1×10^{-5} cm/sec to 3.37×10^{-2} cm/sec. These values are higher than those normally associated with clay due to the fact that monitoring wells where slug tests were performed are screened within the most productive sandy layers of the Woodbridge Formation. Contamination being monitored resides in the lower conductivity clay component of the Woodbridge formation. Therefore, the minimum value of 6.1×10^{-5} cm/sec value was used for the calculation.

The hydraulic gradient was calculated by measuring the difference in hydraulic head at two points divided by the distance between the points. The upper hydraulic reference was MW-5S at the southwestern extreme of the site with a 1998 recorded piezometric elevation of 47.37 feet. The lower reference was the Spa Spring Creek at the northeast portion of the site with a hydraulic elevation of 5.37 feet. The difference of these measurements (42.0 ft) divided by the horizontal distance between them (1,450 feet) equals 0.028966 feet/foot. This represents the average gradient across the site.

A value of 0.25 for the porosity as given in the BIOSCREEN documentation for silts and sands was used.

3.4.1.2.2 Dispersion Parameters

The dispersion parameters are calculated by BIOSCREEN based on the estimated plume extent of 100 feet. This length was assumed based on the fact that downgradient monitoring locations from each well modeled do not exhibit concentrations of constituents, and plumes are considered localized in the vicinity of the wells where contaminants have been detected.

3.4.1.2.3 Adsorption Parameters

The adsorption parameter was entered directly as a retardation factor of 1.0, which assumes there is no retardation, a conservative estimate, which allows maximum plume migration.

3.4.1.2.4 Biodegradation Parameters

The Instantaneous Reaction Model (IRM) was used to model the biodegradation occurring on the site. The IRM was calibrated based on the drops observed in contaminant concentrations at wells MW-6S and MW-11S over the last two years. One round of natural attenuation parameters was collected thus far; three of the IRM parameters (delta oxygen, delta nitrate, and delta sulfate) were estimated using the observed values. Values from zero to the observed oxygen, nitrate, and sulfate concentrations were used (no nitrate was observed in any of the wells tested - only oxygen and sulfate were varied). The higher the delta values, the greater the biodegradation.

3.4.1.2.5 General Parameters

General parameters were varied until appropriate model dimensions were found. The final values used for the model were a width of 50 feet, a length of 150 feet, and varying simulation times (from two to seven years).

3.4.1.2.6 Source Data

Source data were measured or estimated. The source zone thickness in the saturated zone was based on the latest (January 1999) round of ground water sampling. The saturated zone was slightly less than 10 feet thick. For conservatism, the source zone widths were kept narrow. The smaller the source zone, the less biodegradation occurs, which is due to the smaller flux of ground water flowing through the zone, resulting in less source material to fuel biodegradation.

Source concentration data are based on the June 1996 sampling event. Recorded contamination was used as the value at the center of the plume. For purposes of obtaining a typical profile, it was estimated that contamination decreases by half as one proceeds ten feet laterally from the center of the plume.

3.4.1.2.7 Field Data For Comparison

The data in this column represented the value of contamination found in the well during the June 1998 sampling event. This value was used to calibrate the model. By using the June 1996 data as the source data, and running the model for a period of two years, the value at the well should have decreased to the measured 1998 value. Calibration of the model was done by trial and error. The soluble mass (Appendix B: field 6, Source data) was adjusted until the two-year model resulted in a source value equaling the June 1998 recorded concentration.

3.4.1.3 Contamination at MW-6S

MW-6S contained benzene at levels exceeding ground water standards during June 1996, 1997 and 1998 sampling events with levels of 16 ug/l, 14 ug/l and 6.3 ug/l, respectively. A steady decrease in contamination has resulted since the source (drum) removal upgradient of MW-6S prior to the June 1996 sampling event.

Natural attenuation data collected at MW-6S indicate the biodegradation of organic compounds. Comparing natural attenuation data (Table 3-1) from MW-12S (background) with MW-6S shows a significant decrease in oxidation-reduction potential (ORP), and an increase in sulfate, ferrous iron, and methane, indicating oxidation of organic compounds.

Evaluation of data from the downgradient wells, MW-1S and MW-8S, shows no indication of benzene contamination. It can be concluded that either the benzene plume has not reached MW-1S (the most immediate downgradient well) or the benzene has degraded prior to reaching MW-1S.

To estimate future contaminant levels, the BIOSCREEN model was used. Natural attenuation parameters were adjusted by prorating the parameters based on the fraction of benzene to the Total VOC compounds found at the well. Total VOCs and TICs for the June 1996 sampling event were 3,157 ug/l and benzene was 16 ug/l. Natural attenuation parameters were divided by 3157 and multiplied by 16 to obtain the portion attributable to benzene. It can be assumed that the resulting prorated fraction of natural attenuation parameters can be attributed to the degradation of the benzene.

The model was calibrated for benzene as discussed in Section 3.4.1.2.7 using a two-year time period (June 1996 to June 1998). The model was calibrated using the IRM, which assumes degradation by both natural attenuation parameters and dispersion. To be conservative, a retardation factor of 1.0 was used (assumes no retardation).

The model output graph, included in Appendix B, presents the estimated downgradient contamination assuming degradation based on natural attenuation parameters and dispersion (IRM), first order decay (not evaluated), and dispersion only (no degradation). Throughout the BIOSCREEN modeling process, the first order decay coefficient was not utilized due to the lack of site-specific first order decay data. The BIOSCREEN model used a default coefficient to generate the curve shown on the plots. The first order decay data plots should not be considered and only the IRM and the "No Degradation" (i.e., dispersion only) curves are relevant.

The IRM plot shows that at two years (June 1998), the benzene concentration extends approximately 15 feet beyond the well. At eight years (June 2004), benzene is no longer present. The plot that assumes no degradation and only dispersion estimates benzene extending approximately 45 feet beyond the well in two years (June 1998) and approximately 100 feet in eight years (June 2004). If all biological activity ceases downgradient of the well, only dispersion would occur. It is not reasonable to assume this but it is presented for worst case comparison purposes only. In both cases, the contamination did not reach the next down gradient location, MW-1S.

3.4.1.4 Contamination at MW-11S

MW-11S contained elevated levels of BTEX exceeding ground water standards during June 1995, 1996, 1997, and 1998 sampling events with levels of 9,400 ug/l, 9,826 ug/l, 4,532 ug/l and 4,365 ug/l. Soil remediation occurred upgradient at MW-11S in early 1997.

Natural attenuation data collected at MW-11S indicates biodegradation of organic compounds. Comparing natural attenuation data (Table 3-1) from MW-12S (background) with MW-11S shows a decrease in ORP, and an increase in sulfate, and methane, indicating oxidation of organic compounds.

Evaluation of data from the downgradient location, Spa Spring Creek, shows no indication of BTEX contamination. It can be concluded that either the BTEX plume has not reached Spa Spring Creek or the BTEX has degraded prior to reaching it.

To estimate future contaminant levels, the BIOSCREEN model was used. Natural attenuation parameters were adjusted by prorating the parameters based on the fraction of BTEX to the Total VOC compounds found at the well.

The model was calibrated for BTEX as discussed in Section 3.4.1.2.7 above using a two-year time period (June 1996 to June 1998). The model was calibrated using the IRM, which assumes degradation as dictated by natural attenuation parameters and dispersion. To be conservative, a retardation factor of 1.0 was used (assumes no retardation).

The model output graph, included in Appendix B, presents the estimated downgradient contamination assuming degradation based on natural attenuation parameters and dispersion (IRM), first order decay (not evaluated), and dispersion only (no degradation). Throughout the BIOSCREEN modeling process, the first order decay coefficient was not utilized due to the lack of site-specific first order decay data. The BIOSCREEN model used a default coefficient to generate the curve shown on the plots. The first order decay data plots should not be considered and only the IRM and the "No Degradation" (i.e., dispersion only) curves are relevant.

The IRM plot shows that after two years, the BTEX concentration extends approximately fifteen feet beyond the well. After eight years (June 2004), BTEX is no longer present. The plot that assumes no degradation and only dispersion estimates BTEX extending approximately 45 feet beyond the well in two years (June 1998) and approximately 120 feet in eight years (June 2004). If all biological activity ceases downgradient of the well, only dispersion would occur. It is not reasonable to assume this and it is presented for worst case comparison purposes only.

The model was also run for just the benzene in MW-11S in the same manner as above. Sampling data from 1996, 1997, and 1998 indicated benzene levels at 26 ug/l, 17 ug/l and 15 ug/l, respectively. At two years (June 1998), the BIOSCREEN IRM plot showed benzene extending approximately fifteen feet beyond the well; the eight-year estimation showed no benzene beyond the well. The plot that assumes no degradation and only dispersion estimates benzene extending approximately 45 feet beyond the well in two years (June 1998) and approximately 100 feet in eight years (June 2004).

Estimated migration of BTEX and benzene for degradation based on natural attenuation parameters and no degradation fall short of the next downgradient monitoring point, Spa Spring Creek, as estimated for June 2004.

3.4.2 Chlorinated Organic Contamination

Migration and degradation of chlorinated organic contamination in the ground water found at MW-1S and MW-14P cannot be modeled using BIOSCREEN. An evaluation of collected

natural attenuation data and contaminant trends was used to predict migration and degradation potential.

3.4.2.1 Contamination at MW-1S

Contamination exceeding ground water standards at MW-1S consists of DCE and TCE. The following are levels found MW-1S:

| Parameter | 6/96 | 6/97 | 6/98 |
|------------------|----------|----------|----------|
| Cis 1,2 DCE | 43 ug/l | 28 ug/l | 11 ug/l |
| 1,1 DCE | 12 ug/l | 11 ug/l | 10 ug/l |
| TCE | 880 ug/l | 640 ug/l | 280 ug/l |

This data is also presented graphically in Appendix B (Figures 5-3 and 5-4 of the RAR). Section 3.2 discusses the trend data.

Based on the natural attenuation data collected in January 1999, natural dechlorination and subsequent oxidation of vinyl chloride, ethane, and ethene appear to be limiting contaminant migration. Potential dechlorination and oxidation in the ground water at MW-1S are indicated by elevated chloride and methane concentrations. In addition, the presence of DCE (a daughter product of TCE) and TCE together indicates dechlorination is occurring. If dechlorination and oxidation were not occurring, site conditions would promote transport of contaminants, and contaminants seen in MW-1S would be seen in other nearby monitoring wells.

3.4.2.2 Contamination at MW-14P

TCE concentrations slightly exceed the 1 ug/l groundwater standard at MW-14P. TCE has been present at 1.7 ug/l, 1.8 ug/l and 1.1 ug/l in June 1996, 1997, and 1998 sampling events, respectively. This data is presented graphically in Appendix B (Figure 5-11 of the RAR).

Source removal was performed prior to the June 1996 sampling event. Since the source removal, a decrease in contamination has resulted.

The nearest downgradient well to MW-14P is MW-13S, approximately 300 feet away. Contaminants have not appeared in MW-13S. Based on the natural attenuation data collected in January 1999, natural dechlorination and subsequent oxidation of vinyl chloride, ethane, and ethene may be limiting contaminant migration. Potential dechlorination and oxidation in the ground water at MW-14P are indicated by elevated chloride and methane concentrations. If dechlorination and oxidation were not occurring, site conditions would promote transport of contaminants and MW-13S would have detectable concentrations of chlorinated organic compounds.

3.5 NATURAL GROUNDWATER REMEDIATION CRITERIA AND APPLICABILITY

On the basis of modeling and trend analyses presented herein, Witco is proposing a natural ground water remediation at the Facility for residual constituents of concern. A number of factors, such as previous source removals, the degradability of the specific contaminants found, the decreasing contaminant trends, no apparent off-site migration of contaminants, and a reducing environment (wetlands are present on the downgradient side of the Facility), indicate that the Facility's ground water is ideally suitable for natural remediation. Based on current data, criteria necessary for natural ground water remediation can be met.

This section has been written to satisfy the requirements of the Technical Requirements for Site Remediation (specific remedial action requirements for a natural ground water remediation are contained in NJAC 7:26E-6.3(d)). The following are the ten items that must be demonstrated to the NJDEP for a natural ground water remediation. These items are taken directly from 7:26E-6.3(d).

1. Ground water contaminant concentrations will decrease to applicable Ground Water Quality Standards (N.J.A.C. 7:9-6) through degradation, retardation or dispersion under present site conditions.

Ground water contaminant concentrations have steadily decreased throughout the four years (June 1995 through June 1998) of the ground water monitoring program. Section 5.0 - Ground Water Contamination of the RAR presents the ground water data for this period. Section 3.2 above discusses the trends of the contaminants that are present above groundwater standards. The contaminant trend figures are presented in Appendix B (Figures 5-4 through 5-11 from the RAR). As presented in Section 3.2 and Appendix B, contaminant concentrations are steadily, and in some cases rapidly, declining with time. These contaminant concentrations will continue to decrease towards applicable standards due to the natural attenuation processes that have been shown to be occurring at the Facility. Sections 3.3 and 3.4 present natural attenuation parameter analyses and modeling, respectively, which support the occurrence of these processes. Annual monitoring of the contaminant concentrations as well as natural attenuation parameters is proposed for model and trend analysis verification.

Additional items required by the NJDEP to be evaluated to determine the viability of natural remediation as part of Item 1 are:

(1) Contaminant mass, as determined by free or residual product and dissolved phase delineation and dissolved contaminant concentrations;

Four rounds of analytical data for the Facility's ground water exist. Computer modeling utilizing this data has been used to evaluate the contaminant mass. The dissolved phase data has been used since no free or residual product has been observed in the Facility's monitoring wells. Contaminant mass was estimated by using the actual concentrations over the four years and

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extrapolating backwards. The following is a summary of estimated non-chlorinated contaminant mass from the BIOSCREEN model:

| Contaminant | <u>Well</u> | Soluble Mass (kg) | |
|-------------|-------------|-------------------|--|
| Benzene | MW-6S | 0.85 | |
| BTEX | MW-11S | 2.95 | |
| Benzene | MW-11S | 0.015 | |

Section 3.4.1.2.6 discusses this estimation.

(2) Dissolved oxygen content of ground water;

The dissolved oxygen (DO) content of the ground water at the Facility was measured in monitoring wells during ground water sampling in January 1999 (Table 3-1). DO concentrations ranged from 0.40 mg/l to 4.12 mg/l. The presence of dissolved oxygen, coupled with the supporting evidence of on-going biodegradation processes from measured natural attenuation parameters, supports continued reductions in contaminant concentrations by natural remediation. In future rounds of the proposed annual ground water monitoring program, DO data will be collected to assess continued support of biodegradation.

(3) Presence or absence of microorganisms in soil and ground water;

Data were collected to support the presence of microbial degradation processes at the Facility. Three of the additional parameters collected during the June 1999 sampling round, DO, dissolved TOC, and hydrogen, are good indicators as to whether biodegradation is occurring. Reduced levels of DO indicate the presence of aerobic biodegradation. Levels of DO measured in the Woodbridge unit (where contaminated groundwater is present) were much lower than DO levels in perched water, indicating presence of aerobic biodegradation. Dissolved TOC analysis of groundwater indicates that biodegradation is occurring at the site. TOC results from MW-1S (2.7 mg/l), MW-11S (10.2 mg/l), and MW-14P (4.3 mg/l) were appreciably higher than those observed in wells without residual contaminants, indicating biodegradation. The measured TOC at MW-6S (3,570 mg/l) is assumed to be anomalous and not representative of site-wide concentrations. Hydrogen was found in three of the four contaminated wells. This also indicates the presence of biodegradation; however, additional data from future sampling events are needed to draw accurate conclusions.

(4) Ground water flow velocity;

An average ground water flow velocity of 7.3 ft/year for the site was calculated based on hydrological data, including data acquired during the LMS RI/FS. This velocity is sufficient to provide continuous sources of upgradient ground water to nourish biodegradation and facilitate natural remediation of site ground water within relatively short timeframes (modeled at less than five years). On the basis of historic monitoring and modeled results, the ground water flow

velocity does not represent a threat for rapid movement and potential off-site migration of contaminants.

(5) Applicable physical and chemical characteristics of contaminants and contaminant degradation products present in both soil and ground water.

The contaminants present in the aquifer exhibit physical and chemical characteristics which are both suited to and indicative of natural remediation at the Facility. Monoaromatic petroleum hydrocarbons such as BTEX are highly soluble in water and do not typically sorb to subsurface soils unless the aquifer has a high organic carbon content, which is not the case at the Facility (except at MW-6S, which is considered anomalous). With sufficient DO, BTEX compounds are converted to carbon dioxide and water. When the oxygen supply is deleted (DO has not been depleted at the Facility) and nitrate is not present (nitrate was not detected in all samples), other processes are available to continue biodegradation: oxidation via ferric iron (which was detected in all wells) and sulfate reduction/methanogenesis (sulfate and methane were both detected in all wells). The trends reported in Section 3.2 support the steady reduction of BTEX concentrations in the aquifer and the on-going mineralization of hydrocarbons.

Chlorinated aliphatic hydrocarbons such as TCE, 1,1-DCE, and cis-1,2-DCE do not tend to sorb to soils. While soluble in an aquifer, aerobic and anaerobic processes mineralize the hydrocarbons. The reductive dechlorination of TCE to cis-1,2-DCE and the subsequent transformations of cis-1,2-DCE and 1,1-DCE to Vinyl Chloride and further to carbon dioxide and water are well documented and understood. The presence of TCE, 1,1-DCE, and cis-1,2-DCE at MW-1S and the downward trend in concentrations reported in Section 3.2 supports the steady degradation of these compounds under natural conditions.

2. Free and/or residual product in the unsaturated zones, as determined pursuant to N.J.A.C. 7:26E-2.1(a)11, is treated or removed, if practicable, or contained if treatment or removal are not practicable;

Currently no free and/or residual product is present in the unsaturated zone at the Facility. The drum removal effort and the various soil remediation activities have removed likely sources of product. Declining concentrations of chemical constituents in ground water support the assertion that there is no uncontained free and/or residual product at the site.

3. All soil contamination in the unsaturated zone has been or will be remediated to the applicable numeric soil remediation standard in accordance with a schedule approved by the Department;

A large-scale site-wide soil remediation has been completed. Section 4.0 of the RAR documents the various tasks associated with the remediation. Post-excavation samples from the different areas of concern were collected and analyzed. These sample results can be found in the tables accompanying Section 4.0 of the RAR and in Section 2.0 of this Addendum. Results from these samples indicate that cleanup standards were satisfied.

4. Ground water contamination has been delineated to the standard applicable to the nearest downgradient receptor, either the Ground Water Quality Standards, N.J.A.C. 7:9-6, or the more stringent of either the State Surface Water Quality Standard Criteria, N.J.A.C. 7:9B, or the Federal Surface Water Quality Criteria, 40 C.F.R. Part 131, or other applicable standards;

The delineation of the ground water contaminants is based on the four years of data acquired during the ground water monitoring program. Section 4.2 presents the compounds that remain above standards. The modeling results in Section 3.4 indicate that contamination is not migrating off-site. This is evidenced by the fact that there have been no exceedances of surface water quality standards the last two rounds of surface water sampling (June 1997 and June 1998) conducted at SW-004. In fact, no organic contaminants have been detected in the last two rounds. Therefore, there has not been an impact to Spa Spring Creek, the nearest downgradient receptor, for the last two rounds. In addition, groundwater quality standards have not been exceeded at the downgradient-most monitoring wells, MW-12S and MW-13S, during the monitoring program. Therefore, dissolved phase constituents have been delineated.

5. Ground water contaminated above the applicable standard will not reach the nearest downgradient receptor, as estimated by an appropriate ground water flow/contaminant transport model selected pursuant to N.J.A.C. 7:26E-4.4(h)3iv;

The nearest downgradient receptor is Spa Spring Creek. The BTEX wells (MW6S & MW11S) were modeled using BIOSCREEN Intrinsic Remediation Decision Support System from the Air Force Center for Environmental Excellence Technology Transfer Division (Version 1.4). The modeling results show that the contaminated ground water will not reach Spa Spring Creek. The modeling results are presented in Section 3.3. As discussed in the preceding item, downgradient sample points SW-004, MW-12S and MW-13S are not being impacted by either BTEX or chlorinated aliphatic compounds.

6. The fate of the contaminant plume has been documented pursuant to N.J.A.C. 7:26E-6E-6.2(a)17;

The fate of the contaminant migration is documented according to N.J.A.C. 7:26E-6.2(a) 17 in Section 3.4. Modeling results predict that the contaminants will only extend over a limited area. The model also predicts attainment of applicable ground water quality standards for non-chlorinated organic compounds by June 2004. Trend analyses for chlorinated organic compounds anticipate attainment of standards in 2004 as well.

7. Contaminant levels in ground water do not present a vapor risk to any receptors. This determination shall be made on a case-by-case basis;

The levels of VOC contaminants in the Facility's ground water are generally in the tens to hundreds of micrograms per liter, which are not significant enough to pose a vapor risk. Site

workers have not encountered elevated organic vapor readings during monitoring well sampling activities, which would present the highest probability of exposing potential receptors to airborne contaminants. Based on the surface water sampling data, downgradient well (MW-12S and MW-13S) data, and ground water modeling results, contaminants are not migrating off-site and, therefore, do not present a vapor risk to off-site receptors. There are no on-site receptors of groundwater based on existing and probable future pathways; therefore, contaminants do not pose a vapor risk.

8. Predicted impacts to potential receptors are consistent with the current and potential ground water uses based on a 25-year planning horizon as projected by local and county land use documents. This shall include, without limitation information pertaining to the existence of water lines, proposed future installation of water lines, local and/or county ordinances restricting installation of potable wells;

A one-mile radius well search was conducted for the facility. This information was obtained from the NJDEP Water Supply Element Bureau of Water Allocation. The well search results indicate that the Woodbridge is used for industrial purposes and the closest downgradient industrial well belongs to the Russell Stanley Corporation, approximately 500 ft. from Spa Spring Creek.

The towns of Perth Amboy and Woodbridge were contacted to inquire about future water usage. Personnel from both towns stated that local groundwater was not being used for municipal or potable purposes. The Water Department of Perth Amboy pumps water from the Runyon Watershed in Old Bridge Township. Woodbridge obtains its water from Middlesex Water Company, which draws surface water from the Delaware and Raritan Canal in New Brunswick; additional well water is supplied from South Plainfield and Colonia.

The Woodbridge unit is not a productive unit, in regards to groundwater production, and it is unlikely that future uses for the unit exist.

9. All necessary access agreements needed to monitor the ground water quality have been obtained; and

Only on-site wells are proposed for monitoring, since there are no indications of off-site migration of ground water contaminants. Therefore, access agreements will not be required.

10. If a Classification Exception Area needs to be established, the person responsible for conducting the remediation has provided the Department all necessary information in accordance with N.J.A.C. 7:26E-6.2(a)17.

A CEA will be established for the site. Appendix C of this RAR Addendum contains the CEA submittal to the NJDEP. Witco will also provide the notifications required as part of this process.

Monitoring Requirements

Further NJDEP requirements for natural remediation, regarding ground water monitoring, as detailed in 7:26E-6.3(e), are listed below.

- 1. A ground water monitoring program shall be implemented to monitor plume characteristics and movement to calibrate the model used to estimate the eventual extent of the plume, and to assess the effectiveness of the natural ground water remediation. This program shall consist of the following:
- i. Sampling shall be conducted on a quarterly basis at monitoring wells associated with the natural remediation, for a minimum of eight quarters, including:
- (1) At least one area of concern monitoring well located at the source area to monitor plume conditions at the source area:
- (2) At least one plume sampling point located downgradient of the source area but within the contaminant plume except as provided in (e) Ii(3) below;
- (3) At least one plume fringe monitoring well located at the limit of the plume, as determined pursuant to (d)4 above. Depending on the areal extent of the contaminant plume, the Department may determine that one monitoring well may satisfy the requirements of both (e)1I(2) above and this subparagraph; and
- (4) At least one downgradient sentinel well located beyond the zone delineated pursuant to (d)4 above. Contaminant levels in this sentinel well shall remain below the applicable standard. The sentinel well shall be located no closer than three years travel time to the nearest potential downgradient receptor and no further than five years travel time from the delineated downgradient extent of the contaminant plume;

The following outlines the proposed ground water monitoring program for natural remediation:

Four rounds of ground water quality monitoring data covering a four-year period have already been acquired for the Facility. A quarterly sampling program for eight quarters (or two years) is not appropriate given the existing four years of data. Therefore, it is proposed to continue the annual ground water sampling for four more years (or for four more rounds of sampling). After the four-year period, eight rounds of data will exist. At that point in time, the data can be evaluated and the progress of the remediation determined. If it appears that contaminant concentrations will decrease to below GWQS before that time, a modification to the program will be presented to the NJDEP.

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The following are the proposed monitoring well designations for the ground water monitoring program:

- 1. Three Areas of Localized Exceedance (AOLE) Monitoring Wells: MW-1S, MW-6S, and MW-11S
- 2. Two Sentinel Monitoring Wells: MW-12S and MW-13S
- 3. One Sentinel Surface Water Sampling Location, SW-004
- 4. One Fringe Monitoring Well, MW-8S is downgradient of MW-1S and contains detectable levels of chlorinated solvents.
- 5. One Upgradient Monitoring Well, MW-4S.

The proposed ground water monitoring program is presented in more detail in Section 3.7.

2. A Classification Exception Area shall be established for the area of the aquifer impacted by the migrating contaminant plume, pursuant to N.J.A.C. 7:26E-6.1(g) and 6.2(a)17;

A CEA will be established for the site. Section 4.0 describes the details of the CEA documentation.

Item 3 of 7:26E-6.3(e) describes data usage and criteria for the satisfaction of natural remediation.

3.6 CONCLUSIONS

The evaluation of contaminant trends and migration, and degradation of ground water contamination at MW-1S, MW-6S, MW-11S and MW-14P indicates that contamination has degraded and dispersed in a localized region downgradient of each well. Estimates of future contaminant concentrations by the BIOSCREEN model for MW-6S and MW-11S extending to June 2004 (end of requested CEA) indicate that contamination will remain localized and be degraded before reaching down gradient receptors. These conclusions are verified thus far by downgradient locations that have not evidenced contaminant migration.

Witco has demonstrated that the site satisfies the ten criteria that must be demonstrated to the NJDEP for a natural ground water remediation. As part of the natural ground water remediation proposal, a CEA will be in force throughout the Facility. On the basis of historic data, model results, and trend analyses, ground water contaminants are not migrating from the site and the CEA does not have to extend beyond Facility boundaries.

The proposed ground water monitoring program included in Section 3.7 will act as a future confirmation of estimated behavior of ground water contamination. The collected data will also be used to perform further BIOSCREEN modeling and trend analyses to validate the assumptions identified herein.

3.7 PROPOSED GROUND WATER MONITORING PROGRAM

The following subsection outlines the proposed ground water monitoring program to satisfy the requirements for natural ground water remediation (7:26E-6.3(e)) and the CEA.

Four rounds of ground water quality monitoring data covering a four-year period have been acquired for the Facility. Therefore, it is proposed to continue with annual ground water sampling for four additional years (or for four more rounds of sampling). After the four-year period, eight rounds of data will exist, the data can be reviewed, and the progress of the natural remediation determined. If it appears that contaminant concentrations will decrease to below GWQS before the end of the four-year period, a modification to the program will be presented to the NJDEP.

The ground water sampling program will be conducted to monitor the areas of local exceedance (AOLE) found at the Facility. Specifically, the program will address characteristics, concentration decreases, and movement of the AOLE. The data from the numerous monitored parameters will be used to update modeling efforts, estimate the eventual extent of the plume, and to assess the effectiveness of the natural ground water remediation. According to NJAC 7:26E-6.3(e), the wells required to be part of the ground water monitoring program consists of the following:

- (1) At least one area of concern monitoring well located at the source area to monitor plume conditions at the source area;
- (2) At least one plume sampling point located downgradient of the source area but within the contaminant plume except as provided in (e)1i(3) below;
- (3) At least one plume fringe monitoring well located at the limit of the plume, as determined pursuant to (d)4 above. Depending on the areal extent of the contaminant plume, the Department may determine that one monitoring well may satisfy the requirements of both (e)1I(2) above and this subparagraph; and
- (4) At least one downgradient sentinel well located beyond the zone delineated pursuant to (d)4 above. Contaminant levels in this sentinel well shall remain below the applicable standard. The sentinel well shall be located no closer than three years travel time to the nearest potential downgradient receptor and no further than five years travel time from the delineated downgradient extent of the contaminant plume;

For the Witco ground water monitoring program, the seven monitoring wells and one surface water sampling location that will comprise the program will be:

Three AOLE wells. The three wells will be MW-1S, MW-6S and MW-11S. All three of these
wells currently contain at least one organic constituent with a concentration above GWQS.
MW-1S is located near the center of the plant and has exceeded standards for a number of

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chlorinated solvents. MW-6S is located in the area of the PCB remediation where drums were removed and has exceeded the benzene standard. MW-11S is located adjacent to the former location of Test Pit 2 excavation and has exceeded the xylene and BTEX standards.

- 2. One downgradient/fringe well. MW-8S is downgradient of MW-1S and contains detectable levels of chlorinated solvents.
- 3. Two sentinel monitoring wells and one sentinel surface water sampling location. MW-12S and MW-13S will be the most downgradient sentinel wells and SW-004 will be the sentinel surface water location.
- 4. One upgradient monitoring well. MW-4S will serve as the upgradient monitoring point.

3.7.1 Analyses

Monitoring wells will be sampled for a specific list of VOCs and parameters used to measure individual natural attenuation processes.

The volatile organic compounds to be analyzed are as follows:

- 1,1-Dichloroethene
- cis-1,2-Dichloroethene
- Trichloroethene
- Benzene
- Toluene
- Ethylbenzene
- Xylene (total)

The chlorinated compounds will be analyzed by Method 601 – Halogenated Volatile Organics. The BTEX compounds will be analyzed by Method 8260B.

The additional analyses required to assess natural attenuation factors will be:

Alkalinity Nitrate
Methane Sulfate
Hydrogen Chloride
Ethylene Ferrous Iron

Ethane Dissolved Total Organic Carbon

Field measured parameters will also be collected. The parameters will include DO, pH, oxidation-reduction potential, temperature, and specific conductivity.

The low-flow purging and sampling procedure will be used for sample collection.



3.7.2 Hydrological Monitoring

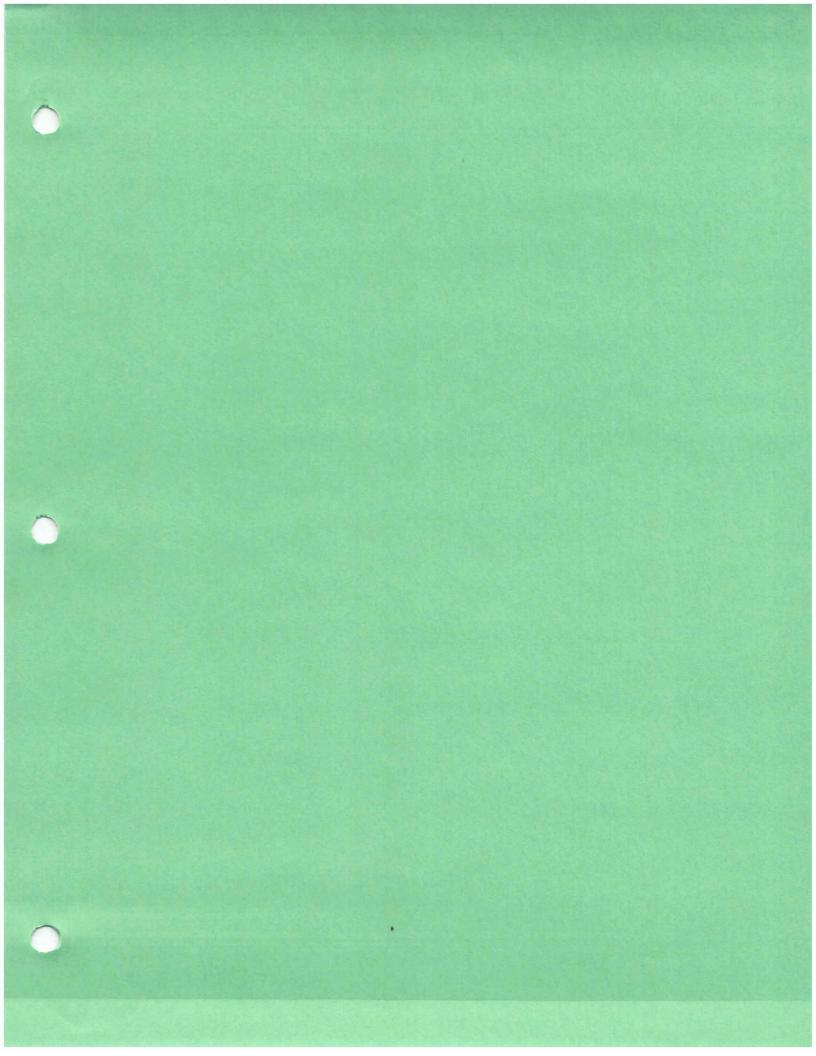
Ground water elevations will be collected as part of the annual program. The elevations will be used to generate potentiometric surface figures that will be used for ground water flow evaluations. The following wells will be utilized for ground water elevation measurements:

| MW-1S | MW-9S |
|-------|--------|
| MW-2S | MW-10S |
| MW-4S | MW-11S |
| MW-5S | MW-12S |
| MW-6S | MW-13S |
| MW-8S | MW-14S |

In addition, a stream gauge will be placed in Spa Spring Creek for collection of surface water elevation measurements.

3.7.3 Well Abandonment

Witco proposes to abandon any on-site wells not being used for the monitoring program. An inventory of the wells to be abandoned will be made. Once the inventory is complete, a Well Abandonment Plan will be submitted to the NJDEP for approval. Upon receipt of approval, a licensed well driller will properly abandon all unused wells.



4.0 CLASSIFICATION EXCEPTION AREA

A CEA will be established at the Witco Perth Amboy Facility. A CEA essentially provides notice that constituents within a given aquifer do not meet the GWQS pursuant to N.J.A.C. 7:9-6. The CEA is required as part of an approved remedy whenever GWQS are exceeded by constituents in site ground water. The CEA documentation consists of a detailed written description, as well as maps and drawings displaying elements of the CEA. There are three basic sections to a CEA:

- 1. Boundaries
- 2. Contaminants
- 3. Longevity

These elements are discussed below. The CEA notification letter TO NJDEP and figure depicting boundaries are included as Appendix C.

4.1 BOUNDARIES

Witco's on-going semi-annual ground water monitoring program has detected declining chemical concentrations at four monitoring well locations (MW-1S, MW-6S, MW-11S and MW-14P). Contaminants are dispersed locally at these wells as plumes with limited lateral extent. Since the plumes are themselves dispersed throughout the Facility and the contaminants of concern are not expected to migrate off-site, the proposed boundaries of the CEA for the Witco Perth Amboy Facility are the site property boundaries.

The site is an active manufacturing facility located at 100 Convery Boulevard in Perth Amboy, New Jersey. It is bounded on the north by the Spa Spring Creek and the properties of Russel Stanley; on the east by Amboy Avenue; on the south by Chevron Oil Company; and on the west by Convery Boulevard. The CEA occupies multiple blocks and lots including: Block 470, Lots 1.01 and 1.02; Block 471, Lot 1; Block 472.03, Lots 1-13, 30, and 32-35; and Block 474, Lot 1.01.

The Woodbridge Member of the Raritan Formation is the impacted aquifer. This is the uppermost unconfined aquifer in the area. There is no evidence that the underlying Farrington Member has been impacted; therefore, it is not included in this CEA.

4.2 CONTAMINANTS

Site ground water contaminants in excess of GWQS are discussed below. For a complete compilation of ground water sampling data, refer to the RAR.

Residual ground water contamination remains on-site at levels exceeding GWQS. Ground water contaminants for which this area is being restricted include the following: chloromethane,

methylene chloride, 1,1-dichloroethene, cis-1,2-dichloroethene, trichloroethene, benzene, toluene, ethylbenzene, and xylene. Table 4-1 summarizes applicable GWQS and surface water quality criteria proposed for compliance monitoring at Spa Spring Creek.

4.3 LONGEVITY

A CEA is in effect for a specified period of time, which is based on the amount of time estimated to reduce contaminant levels within the aquifer to below GWQS. In addition, NJDEP requirements for natural remediation, which is the proposed remedial action for this site (see Section 3.0), include a minimum of eight rounds of ground water sampling. To date, four rounds of ground water sampling have been completed. Four more years of annual monitoring are porposed in order to meet the NJDEP requirement. The proposed longevity of the CEA is four years (2000 through 2004).

4.4 PROPOSED GROUND WATER MONITORING PROGRAM

The CEA does not specify ground water monitoring requirements since it functions only as a notification mechanism, and not a "stand alone" enforcement or regulatory document. If the site is determined to be in a present or future ground water use area then N.J.A.C. 7:26E-6.4(a)6 applies:

6. If a Classification Exception Area was established as part of the remedial action in a ground water use area, the person responsible for conducting the remediation shall collect two rounds of ground water samples from all monitoring wells that exhibited contamination above respective Ground Water Quality Standards within 120 calendar days after the established expiration of the Classification Exception Area to confirm the effectiveness of remediation. The time between sampling events shall account for seasonal fluctuations in the ground water table. The ground water sampling results shall be submitted to the Department for review, along with recommendations regarding any additional actions required. The Classification Exception Area will remain in place until sampling results confirm that the contaminant concentrations have decreased to or below the applicable ground water quality standard.

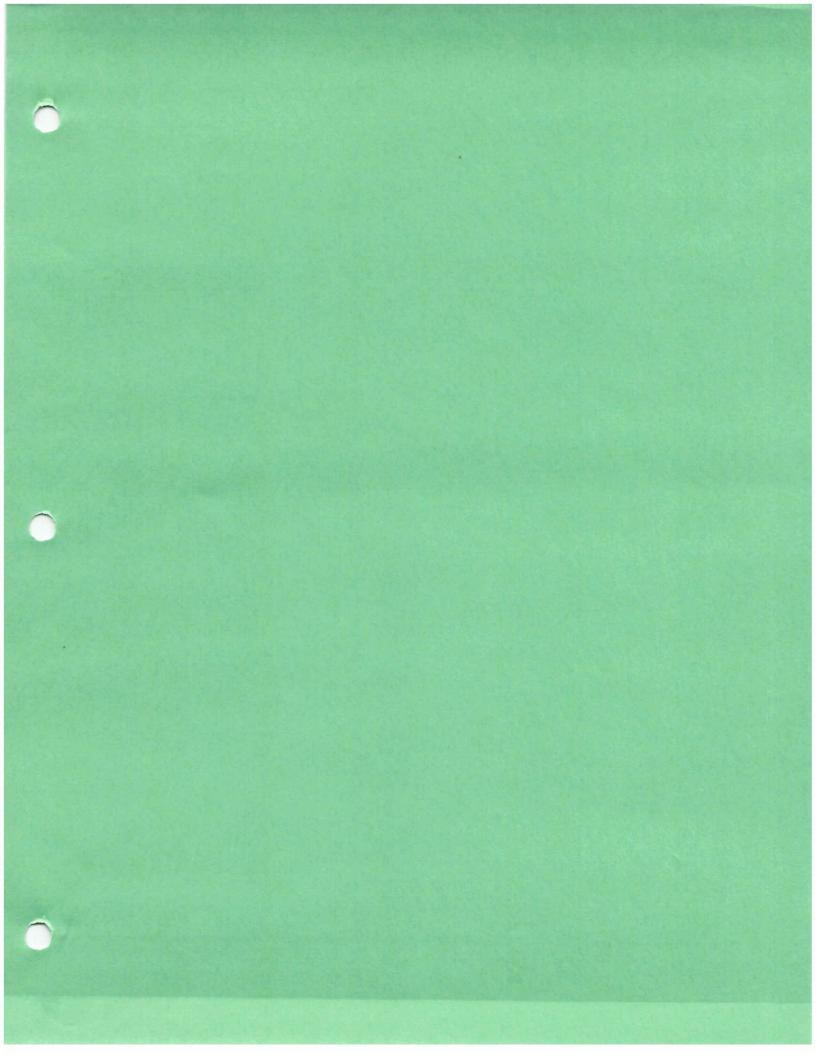
A ground water monitoring program to satisfy the requirements for natural attenuation remediation (N.J.A.C. 7:26E-6.3(e)) and the CEA (N.J.A.C. 7:26E-6.4(a)6) is proposed in Section 3.6. The final two rounds of the proposed program will account for seasonal fluctuations in the ground water table (assuming they are collected in June of the third year and in February of the fourth year). After the fourth round, the data will be evaluated and the progress of the remediation determined. If it appears that contaminant concentrations will decrease to below GWQS before the end of the sampling program, a modification to the program will be presented to the NJDEP.

4.5 PUBLIC NOTICE REQUIREMENTS

NJAC 7:26E-6.2(a)17v requires that notice be sent to the local health department and township clerk when a CEA is put into effect. Consistent with NJDEP regulations, the following will be included in the notifications to the Perth Amboy township clerk and health department officials:

- 1. Name and address of person responsible for implementing CEA
- 2. The name of the site
- 3. Site EPA identification number
- 4. Street address and lot and block numbers
- 5. Brief description of the current use and occupancy of the site
- 6. The nature of the remedial action to be performed and projected duration
- 7. The anticipated start date of the remedial action
- 8. Location of the site in GIS-compatible format
- 9. The limitation on groundwater usage based on the contamination present and the proposed remedial action
- 10. Copy of document identifying engineering or institutional controls on groundwater

Local officials have been contacted regarding present and future use of groundwater in the area. The limited wells within a one-mile radius are used for industrial purposes. Perth Amboy officials report that none of the wells in the area are used as sources of potable water. Furthermore, there are no long-terms plans to use the aquifer as a source of potable water.



5.0 **DEED NOTICE**

This section presents information for the establishment of a Deed Notice. A Deed Notice is necessary for the Witco Perth Amboy Facility as residual soil contamination is present at levels exceeding NJDEP Residential Cleanup Criteria. Therefore, acceptable uses of the property are limited. The site as a whole will be restricted to Non-Residential Use only. Witco presently operates a chemical manufacturing plant and plans to continue using the property for industrial purposes. In addition, localized areas of exceedance are present on-site where residual soil contamination is in excess of NJDEP Non-Residential Cleanup Criteria. Additional restrictions will apply to these areas. The Draft Deed Notice submittal is included as Appendix D.

5.1 CONTAMINANTS

The contaminants of concern present on-site are residual PCBs at levels in excess of the State of New Jersey Residential Cleanup Criterion of 0.49 ppm. Delineated localized areas of exceedance contain residual PCB contamination in excess of the Non-Residential Cleanup Criterion of 2 ppm. PCB levels in the delineated localized areas of exceedance are generally between 2 and 50 ppm; however, concentrations in excess of 50 ppm (see Section 2.0) are found in the heater pad area (Appendix D, Figure B-2.1). These soils could not be removed without destabilizing the adjacent building foundations.

In addition to residual PCB contamination, the rubble pile area, located east of the main plant (Appendix D, Figure B-2.1), contains two other pollutants with concentrations that exceed the State of New Jersey Non-Residential Cleanup Criteria. These pollutants include arsenic at a concentration of 62 ppm (cleanup criterion of 20 ppm), and benzo(a)pyrene at concentrations ranging from 5 to 12.4 ppm (cleanup standard of 0.66 ppm).

5.2 **EXTENT**

As mentioned above, the Deed Notice pertains to the site as a whole in limiting its use for Non-Residential purposes only. Additional restrictions exist for the localized areas of exceedance within the Facility delineated in Appendix D, Figures B-2.1 through B-2.5.

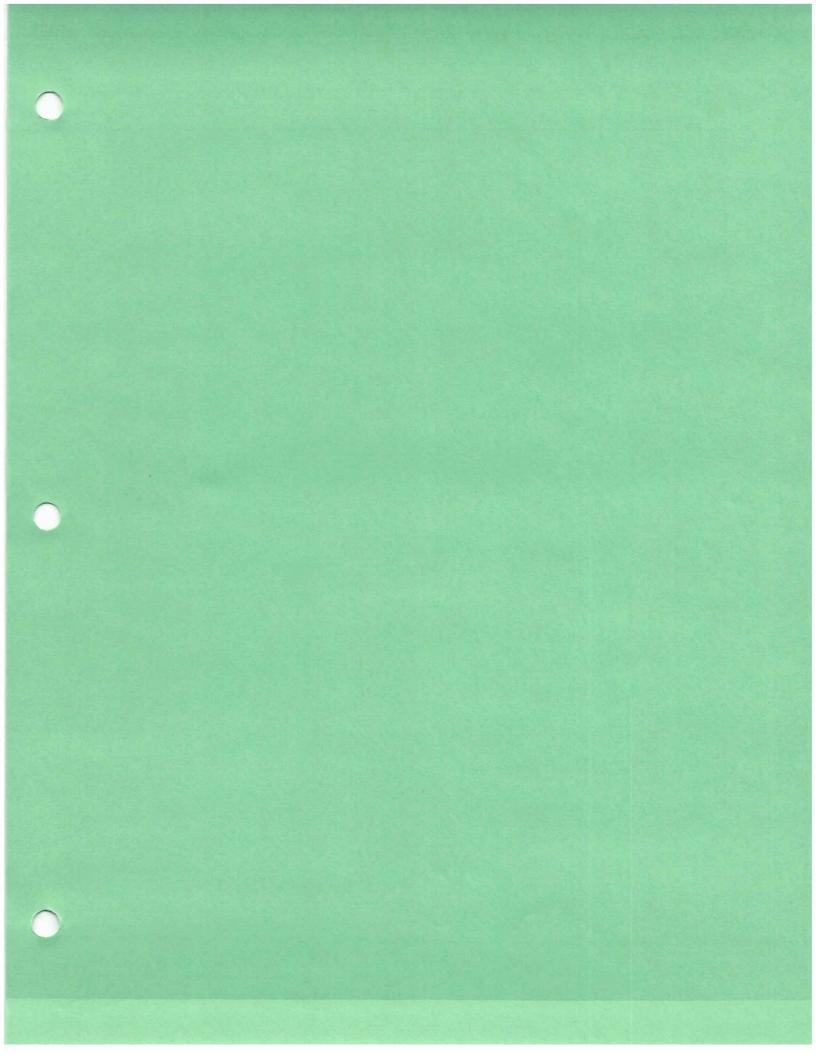
5.3 **ENVIRONMENTAL CONTROLS**

The localized areas of exceedance delineated in the Deed Notice have engineering controls in place. These controls consist of a clean soil cover at a minimum of 2 feet covering the areas containing residual contamination in excess of Non-Residential Cleanup Criteria (Appendix D, Figures B-2.1 through B-2.5). In the heater pad area (Figure B-2.1), the clean soil is separated from the contaminated soil at the bottom of the excavation by a PVC liner and the area is capped with concrete. Environmental controls include hydroseeding of the clean soil cover and regular maintenance of this vegetative cover.



5.4 PUBLIC NOTICE REQUIREMENTS

A Draft Deed Notice (Appendix D) will be submitted to the NJDEP for approval. The final Deed Notice will be recorded with the Middlesex County Clerk, the City of Perth Amboy Clerk and the City of Perth Amboy Health Department. A copy of the filed Deed Notice will then be sent to the NJDEP.



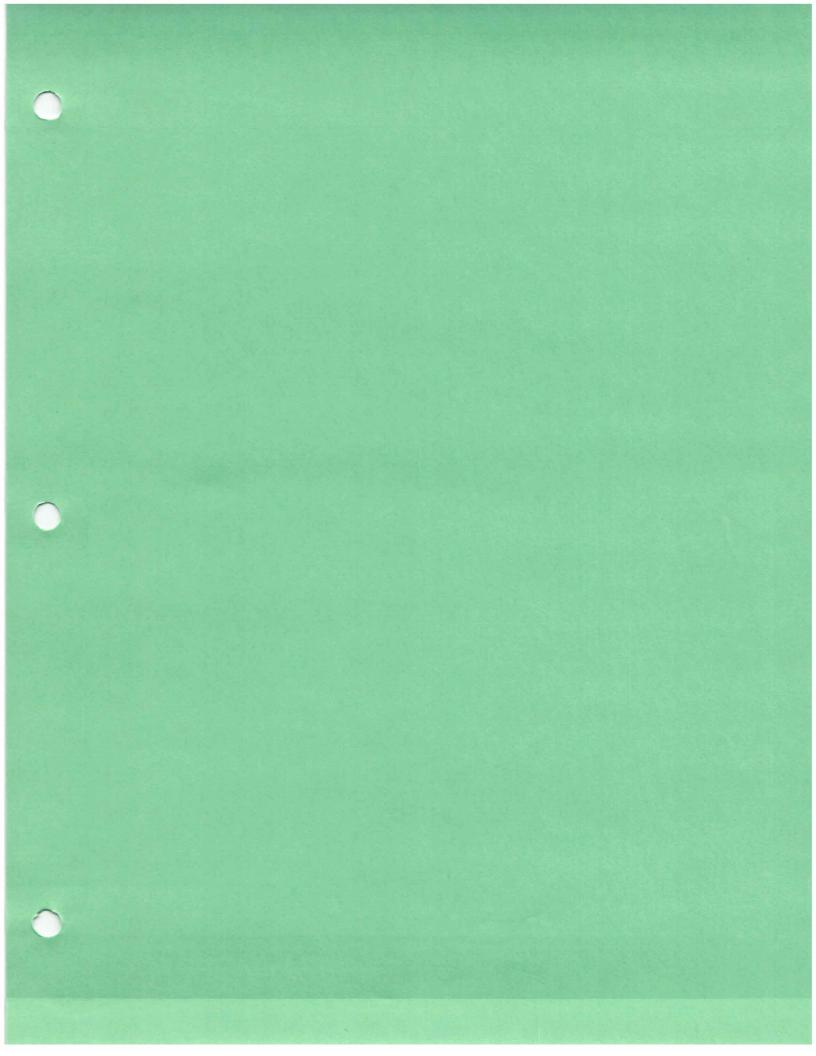
6.0 CONCLUSIONS

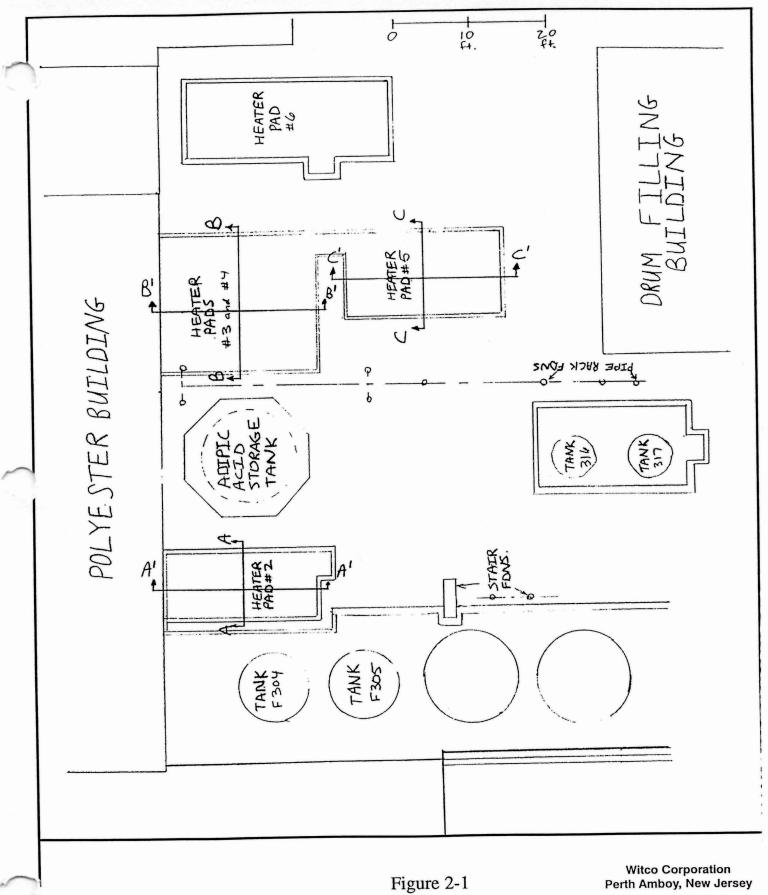
Witco has expended significant time and resources conducting a site-wide remediation of their Perth Amboy Facility over the past 15 years. A Remedial Action Report, detailing the majority of these efforts, was submitted to the NJDEP in November 1998. This RAR Addendum summarizes the final actions and/or items remaining for the completion of remedial efforts for the facility.

Remedial actions for soils and sediments have removed these contaminated media from throughout the Facility to the most practical extent possible. The locations at the Facility where soils and sediments with contaminant concentrations above cleanup criteria remain will be identified in a Deed Notice. The proposed Deed Notice can be found in Appendix D. Witco requests a conditional No Further Action for soils based on the successful remedial actions in the past and the proposed Deed Notice.

The compounds found in the ground water underlying the Facility have been thoroughly documented during previous investigations. A ground water monitoring program has been in place for five years. Although exceedances of GWQS exist, there appears to be sufficient degradation decreasing the concentrations of these compounds and no off-site migration of the contaminants is evident. A natural remediation of the ground water is proposed due to these factors. A CEA will be established for the facility that will document the compounds above the GWQSs. Appendix C contains a copy of the proposed CEA. Witco requests a conditional No Further Action for ground water based on the implementation of the natural ground water remediation and the establishment of the CEA.







Heater Pad Area



FOSTER WHEELER ENVIRONMENTAL CORPORATION

TABLE 2-1 POST-EXCAVATION SAMPLE DATA HEATER PAD REMEDIATION WITCO CORP. PERTH AMBOY

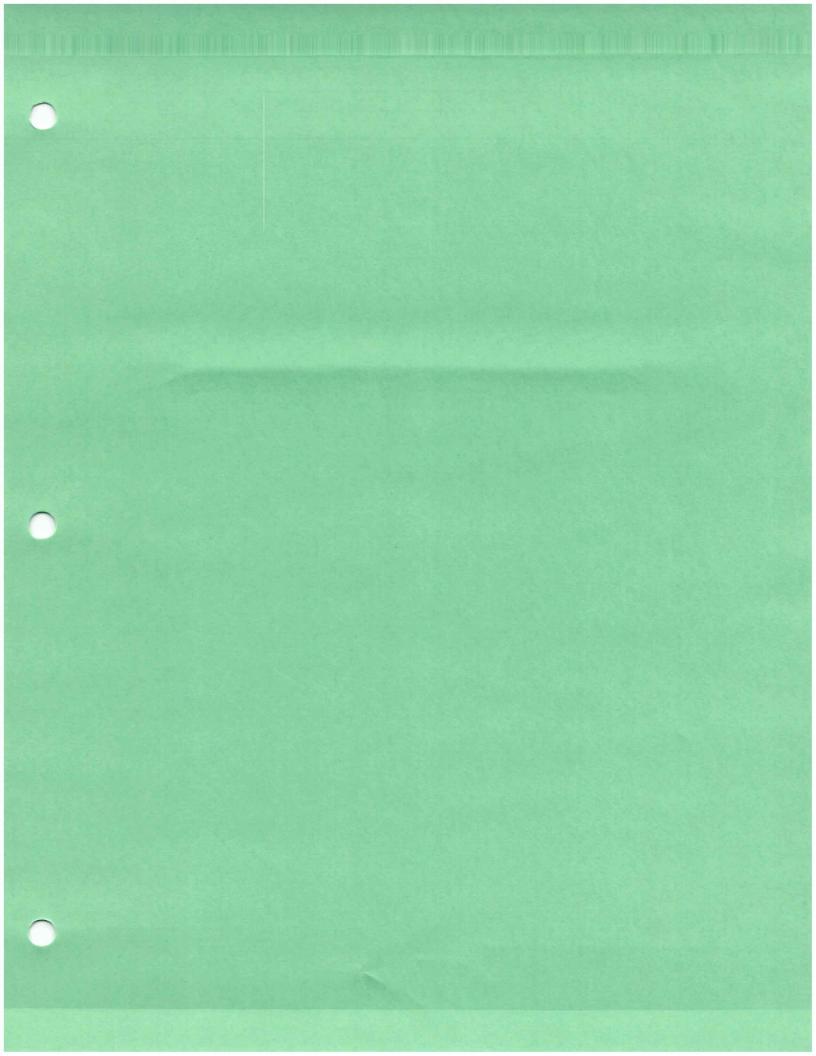
| SAMPLE ID | SAMPLE | LOCATION | SOIL DESCRIPTION | PID | | Aroclor | |
|-----------|---------|------------------|--|---------|-----------------|-----------------|-----------------|
| | | | | (nnm) | 1242 (mg/kg) | 1248 (mg/kg) | PCBs (mg/kg) |
| | DATE | | | (ppiii) | (ilig/kg) | (mg/kg) | (mg/ng) |
| Pad #2 | | | Owner with tan ataining CLAV | 0.0 | ND | 72 | 72 |
| WCH201 | 2/11/99 | Bottom,middle | Gray, with tan staining, CLAY | 0.0 | ND | 740 | 740 |
| WCH202 | 2/11/99 | Sidewall,north | Very dark gray, with olive staining and yellow pockets, CLAY | 0.0 | ND | 7.1 | 7.1 |
| WCH203 | 2/11/99 | Sidewall,east | Gray CLAY | 0.0 | ND | 200 | 200 |
| WCH204 | 2/11/99 | Sidewall,south | Gray, with tan staining, silty CLAY | | 900 | ND | 900 |
| WCH205 | 2/11/99 | Sidewall,west | Gray, with black staining, sandy CLAY | 0.2 | 1960 1961 1961 | | 130 |
| WCH206 | 2/11/99 | Duplicate of 01 | Gray, with tan staining,CLAY | 0.0 | ND | 130 | 130 |
| Pad #s3&4 | | .' | - W3 AK4 | | | 4.0 | 1 |
| WCH301 | 2/10/99 | Bottom,middle | Gray CLAY | 0.1 | ND | 1.9 | 1.9 |
| WCH302 | 2/10/99 | Sidewall,north | Dark reddish brown, with black staining, clayey SAND | 1.9 | ND | 80 | 80 |
| WCH303 | 2/10/99 | Sidewall,east | Gray CLAY | 0.0 | ND | 0.25 | 0.25 |
| WCH304 | 2/10/99 | Bottom,south end | Tannish gray clayey SAND | 0.1 | ND | 0.088 | 0.088 |
| WCH305 | 2/10/99 | Sidewall,west | Gray, with orange staining, CLAY | 0.3 | ND | 2,900 | 2,900 |
| WCH306 | 2/10/99 | Duplicate of 04 | Tannish gray clayey SAND | 0.1 | ND | 0.80 | 0.80 |
| Pad #5 | | • | | | | | |
| WCH501 | 2/10/99 | Bottom, middle | Gray clayey SAND | 0.0 | ND | 0.56 | 0.56 |
| WCH503 | 2/10/99 | Sidewall,east | Gray CLAY | 0.0 | ND | 29 | 29 |
| WCH504 | 2/10/99 | Sidewall,south | Light gray, with orange staining, CLAY | 0.0 | ND | 3.2 | 3.2 |
| WCH505 | 2/10/99 | Sidewall,west | Gray CLAY | 0.1 | ND | 1.3 | 1.3 |
| WCH506 | 2/10/99 | Duplicate of 03 | Gray CLAY | 0.0 | ND | 3.6 | 3.6 |
| Blanks | | · | | | | | |
| WCFBHP1 | 2/10/99 | Rinsate | NA | NA | ND | ND | ND |
| WCFBHP2 | 2/11/99 | Rinsate | NA | NA | ND | ND | ND |

ND-Not detected in sample. NA-Not Applicable Aroclors 1016, 1221, 1232, 1254, 1260, 1262, and 1268 not detected in any sample

Table 3-1Natural Attenuation Parameter Sample Results

| | | ORP | DO | TOC | ALKALINITY | CHLORIDE | NITRATE | SULFATE | FERROUS IRON | METHANE | ETHANE | ETHENE | HYDROGEN |
|---------------|-------------|-------|------|--------|------------|----------|---------|---------|--------------|---------|--------|--------|----------|
| SAMPLE ID | SAMPLE DATE | mv | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | ug/l | ug/l | ug/l | nm/l |
| WC-MW1S-0299 | 2/10/99 | 30.9 | 1.39 | 2.7 | 21.8 | 92.0 | ND | 65.9 | 8.3 | 1420.0 | ND | ND | <0.5 |
| WC-MW6S-0299 | 2/10/99 | 28 | 1.60 | 3570.0 | 1780.0 | ND | ND | 153.0 | 1160.0 | 636.0 | ND | ND | 2.66 |
| WC-MW8S-0299 | 2/9/99 | 102.7 | 2.80 | 1.5 | 48.9 | 81.0 | ND | 71.2 | 11.8 | 145.0 | ND | ND | 4.8 |
| WC-MW11S-0299 | 2/10/99 | 13.6 | 1.20 | 10.2 | 52.0 | 27.0 | ND | 118.0 | 10.1 | 1090.0 | ND | ND | 2.34 |
| WC-MW12S-0299 | 2/8/99 | 116.5 | 0.40 | 0.0 | 53.0 | 10.0 | ND | 98.0 | 15.1 | 13.1 | ND | ND | 2.5 |
| WC-MW14P-0299 | 2/9/99 | 220.2 | 4.12 | 4.3 | ND | 90.0 | ND | 45.8 | 0.2 | 895.0 | ND | ND | 3.7 |

ND = not detected



APPENDIX A HEATER PAD REMEDIATION MISCELLANEOUS DATA

EXHIBIT A-1

WITCO NOTIFICATION LETTER RELATED TO PCB REMEDIATION AND WASTE MANAGEMENT ACTIVITIES AND USEPA RESPONSE LETTER



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION II EDISON, NEW JERSEY 08837

MAY 0 4 1998

Stephen D. Kohlhase, Corporate Engineering Manager Witco Corporation
One American Lane
Greenwich, Connecticut 06831-2559

Dear Mr. Kohlhase:

This is in response to your March 18, 1998 letter to Mr. David Greenlaw of my staff concerning remediation of polychlorinated biphenyls (PCBs) at the Witco Corporation facility in Perth Amboy, New Jersey. You have proposed that PCB contaminated soil in the heater pad area be removed to the extent practicable (or until the soil in the excavation contains less than 50 parts per million (ppm) of PCBs) and properly disposed. Post excavation samples will be obtained and the excavation lined and refiled with clean fill. The area will then be covered by concrete. Additional removal would impact existing essential structures. Mr. Weber of Foster Wheeler Environmental corporation clarified that the 1 foot:1foot side slopes below grade under footings and the 2 foot:1 foot side sloop below building foundations is necessary for structural support. The entire remediation will be implemented in conjunction with a New Jersey Department of Environmental Protection (NJDEP) work plan which is to be developed.

We agree that the proposed remediation, as part of a NJDEP work plan, will be adequate to comply with the requirements of the federal PCB regulations, 40 C.F.R. Part 761. All materials containing PCBs at concentrations of 50 ppm or greater must be manifested and disposed in accordance with the federal PCB regulations. Based on previous contamination in the area, the excavated soil shall be assumed to contain PCBs at concentrations of 50 ppm or greater unless demonstrated otherwise. Each one foot layer of soil removed will be screened as to PCB concentration. The summary report described in your proposal, which is to be sent to EPA, is appropriate.

Please note that this determination for the specific situation at the Perth Amboy facility and may not be relied upon for other PCB remedial situations without written confirmation from EPA. This determination is also dependent upon the information provided with your letter and we may revise our determination if additional information substantially impacts the situation or if NJDEP has concerns not addressed here.

If you have any questions on this determination, or for future discussions on this issue, you may call Mr Greenlaw at (732) 906-6817.

Sincerely.

Kenneth S, Stoller, P.E., P.P., QEP, DEE, Chief,

Pesticides and Toxic Substances Branch

Witco

Witco Corporation One American Lane Greenwich, CT 06831-2559 (203) 552-2000 (203) 552-2010 Fax

March 18, 1998

Mr. David Greenlaw PCB Program Coordinator USEPA Region 2 2890 Woodbridge Avenue Edison, New Jersey 08837

Re: Notification of PCB Remediation and Waste Management Activities, Witco Corporation Facility, Perth Amboy, New Jersey

Dear Mr. Greenlaw:

As a follow-up to your recent conversation with representatives from Foster Wheeler Environmental Corporation, our environmental consultant, Witco Corporation is providing the United States Environmental Protection Agency (USEPA) with formal notification of our intent to remediate and dispose of polychlorinated biphenyl (PCB) wastes. Enclosure 1 provides a brief overview of our planned activities and focuses on our intent to:

- remediate PCB-contaminated soil to the extent practicable in an area of concern complicated by surrounding structures and foundations;
- quantify residual PCB concentrations in the soil after excavation is complete;
- place a liner between the bottom of our excavation and certified-clean backfill;
- cover the excavated areas with a concrete cover;
- comply with federal, state, and local requirements, including NJDEP technical requirements for site remediation; and
- prepare a Declaration of Environmental Restriction (DER) on the site in accordance with NJDEP requirements.

According to the information given to Foster Wheeler Environmental Corporation, if USEPA approves of our approach and is satisfied with this notification, a letter stating such will be issued to Witco Corporation shortly. Recognizing we must first gain NJDEP approval of a Remedial Action Work Plan (RAWP) before we start work, and USEPA approval will eliminate potential delays associated with iterations of agency reviews, we ask that you provide us with any feedback on this matter at your earliest convenience. Mr. Gary Lipsius, the NJDEP Case



Manager, has stated that our inclusion of the USEPA approval letter in our RAWP will make his job very easy and hopefully get us in the field as soon as possible.

If you have any questions or comments regarding this matter, please call me at (203) 552-2408 or Mr. Steven Weber of Foster Wheeler Environmental Corporation at (973) 597-7039.

Sincerely,

WITCO CORPORATION

Stephen D. Kohlhase

Corporate Engineering Manager

cc: G. Lipsius, NJDEP

S. Weber - FWENC

J. Raspa - Perth

M. Pittignano - WWH

J. Nortz - WWH

CE File 60-597.10.20

ENCLOSURE 1 NOTIFICATION OF PCB REMEDIATION AND WASTE MANAGEMENT ACTIVITIES

BACKGROUND

The Witco Perth Amboy facility (Facility) is located at 1000 Convery Boulevard in Perth Amboy, New Jersey. It occupies 44.7 acres and is an active manufacturing facility. It is bounded to the north by the Spa Spring Creek and properties of Russell Stanley, to the east by Amboy Avenue, to the south by Chevron Oil Company, and to the west by Convery Boulevard. Figure 1 depicts the location of the Facility.

The environmental setting of the Facility is heavy industry. Local zoning of Witco's property is M-1 and M-3 (manufacturing). Zoning of adjacent properties are M-3 and R-50 (medium-density single-family residential) to the east, M-1 and R-M (H) (high-rise multi-family residential) to the south, and C-3 (commercial) and R-60 (low-density single-family residential) to the west.

The eastern portion of the Facility consists of woods, heavy underbrush, and swamp. This portion has not been used for any plant manufacturing processes, but a small fraction has been used for disposal or storage of construction rubble, drums, petroleum asphalts, and other debris in the past. Figure 2 shows the site features.

Until the late 1970's, Witco's Organics Division and Asphalt Division operated concurrently at the Facility. Presently, only the Organics Division is operational. Products manufactured currently at the Facility include: polyester resins, blended emulsifiers, sulfosuccinates, alkane sulfonates, anionic surfactants, sodium isothionate, and non-metallic and metallic stearates.

On-site releases of PCBs prior to 1978 have been documented. The NJDEP Remedial Investigation / Feasibility Study (Lawler, Matusky, and Skelly (LMS), 1991) divided the Facility into five Areas of Concern (letters A through E), as shown in Figure 3. Numerous samples were taken at test pits and from excavations. Additionally, samples were taken from material stockpiled for re-use on site as backfill. The majority of field samples taken were analyzed using an approved PCB field screening method. Confirmatory samples were analyzed using USEPA Method 8080. The field screening program determined PCB concentrations greater than 50 mg/kg and less than 2 mg/kg. Numerous samples were found to contain over 50 mg/kg using the field screening method. Approximately 25 % of the samples were verified using USEPA Method 8080. Generally, the concentration of PCBs found in stockpiled soil were as high as 5,000 mg/kg. Post-excavation samples contained PCB concentrations as high 3,700 mg/kg.



Witco's Perth Amboy facility is a RCRA regulated manufacturing plant. However, all corrective action activities are voluntarily performed in accordance with the requirements of NJDEP, as specified in the September 10, 1985 "Stipulation of Settlement" and amended in the "Second Amendment to the Stipulation of Settlement", dated January 12, 1993. Numerous remedial actions and investigations were performed in order to satisfy the conditions of the "Stipulation of Settlement" and the "Second Amendment to the Stipulation of Settlement". The following table summarizes the remedial actions and investigations that have been performed at the Facility. The heater pad remedial action will be the final activity to satisfy the "Stipulation of Settlement" and the "Second Amendment to the Stipulation of Settlement".

| Date | Type of Activity | Results | |
|---------------|---|--|--|
| 1983 | Remedial Action | Approximately 1,500 tons of PCB contaminated soil associated with process heaters were removed. | |
| 1986 | Remedial Action | Approximately 660 tons of PCB contaminated soil were removed from the Facility. | |
| 1986 | Remedial Action | Waste containing vanadium pentoxide catalyst was excavated and disposed off-site. | |
| 1988 | Remedial Action | The polyester heater area was excavated and closed. | |
| 1989 | Remedial Action | Cleanout of facility sewer system. | |
| 1991 | Remedial Investigation / Feasibility Study (RI/FS) | Lawler, Matusky, and Skelly (LMS) divided the facility into 5 Areas of Concern (AOCs). LMS also conducted Facility-wide investigations to determine extent of buried metal objects and chemical constituents of concern. | |
| 09/91 | Remedial Report | "Task 2 - Phase I, Phase II Sampling Report" was prepared by LMS and submitted to NJDEP. This report summarized findings of the RI/FS. | |
| 07/92 | Remedial Report | "Task 5 - Evaluation of Alternatives" was prepared by LMS and submitted to NJDEP. This report evaluated the alternatives that resulted in proposed remedial action. | |
| 1993 | Remedial Action | Construction and activation of new wastewater collection and treatment system. System currently in operation. | |
| 1995- 1996 | Remedial Action | Approximately 14,858 tons of TSCA regulated (i.e., PCB concentration > 50 ppm) and 15,224 tons of non-TSCA regulated (PCB concentration < 50 ppm) soil and sediment were removed during a site-wide remedial action. | |

PROPOSED REMEDIAL ACTIVITIES

The proposed remedial activities will be implemented in the heater pad area. The heater pads and curbs are located adjacent to critical, active operating units in AOC D (see Figure 3). Previous remedial actions in the heater pad area were terminated adjacent to pads and foundations due to the presence of active operating units. The heaters have since been removed from the pads, affording clear access to underlying contaminated soil.

This remedial action will include the demolition of concrete heater pads (and related curbs), the excavation of contaminated soil, placement of a PVC liner, placement and compaction of



certified-clean backfill, and construction of new concrete slabs. Adequate care will be taken by the remediation contractor to prevent any damage to adjacent structures, including pipe rack supports, aboveground storage tanks, and a process building. This care will be extended to liners installed during previous remedial actions which are bolted into concrete foundations adjacent to the proposed areas of excavation. As-built drawings showing the locations, grades, and connection of the liners to the concrete foundations will be provided to the contractor.

Demolition will begin with concrete saw-cutting. After the perimeters of all concrete pads are cut, the contractor will provide both equipment-mounted and manual jack-hammer equipment to break the concrete into manageable pieces. Manual jack-hammer equipment will be utilized in areas that are inaccessible to the equipment-mounted units. If any reinforcing steel poses a problem during demolition, it will be cold cut using reciprocating saws. Hot cutting (i.e., torches) may be used, provided facility hot work conditions are met.

The contractor will propose a waste handling plan for the characterization and disposal of debris from the demolition of the concrete pads and curbs. The contractor will prepare the waste handling plan to ensure that the proper characterization, stockpiling, and disposal of waste materials occurs. The contractor may, at its own option and cost, either sample and analyze waste materials for disposal or assume a material disposition in compliance with applicable regulations. The waste handling plan will address the issues of sampling, characterizing, stockpiling and transporting all waste streams generated during the execution of this work.

The PCB contaminated soil located beneath the concrete heater pads will be excavated to the maximum elevations and limits shown on Figure 4. Periodic testing of the excavation at one foot depth intervals will be performed with commercially available immunoassay PCB test kits to determine if excavation may cease at a shallower depth. The soil will be excavated vertically to the bottom of the existing concrete foundations. From that elevation, the excavation will proceed at a 1V:1H slope to the elevations shown in the drawings. An excavator will load material into dump trucks, which will transport the soil to the on-site stockpile area. Stockpiled material will be placed on an appropriate (i.e., double-containment) surface and will be covered with secured plastic sheeting. The dump trucks used to transport the excavated soil will be decontaminated after unloading and prior to leaving the stockpile area.

After the soil is removed in accordance with the drawings, post-excavation confirmatory sampling will occur. The post-excavation sampling program will comply with NJDEP Technical Regulations (i.e., one sample per 900 square feet of excavation bottom and one sample per 30 linear feet of excavation wall).

After post-excavation sampling, the contractor will place and secure a PVC liner. The liner will be 30 mil PVC pond liner, which should provide long-term separation of underlying contaminated soil with overlying clean backfill. Prior to placement, the contractor will ensure that the surface of the excavated soil is free of any sharp protrusions that could damage the liner.



Any cavities in the soil will be filled with clean material to provide a smooth, continuous base on which to place the liner. The liner will be placed in such a manner that prevents the liner from being unnecessarily stretched during backfill placement. The liner will be connected to the existing foundations using battens and bolts.

Prior to mobilization, the contractor will submit to Witco the proposed source of backfill for the excavated areas. The backfill will be certified-clean granular fill material. The material will be a sandy gravel or clean fine gravel material that is free of organic material, wood, trash, or other material that is considered objectionable to Witco. The contractor will make all arrangements for the delivery of the backfill to the site.

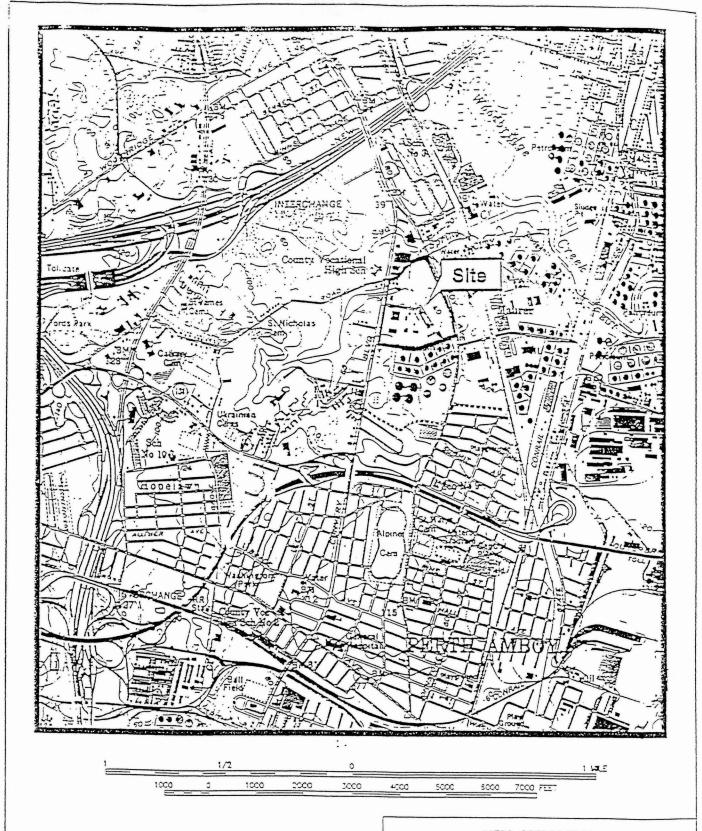
The contractor will stockpile backfill material on site prior to placement in such a manner that it is protected from erosion and water intrusion. After placement of the PVC liner, the backfill will be placed in horizontal layers. Given the size and locations of the excavation areas, it is not expected that the use of compaction equipment will be practicable. Therefore, the maximum thickness of each uncompacted layer will be 6 inches. Self-propelled compaction equipment will be used to achieve 95% of the maximum dry density, as determined by ASTM D1557. The contractor will perform inspections and testing of the placement and compaction of backfill.

After acceptance of the backfill placement by Witco, the contractor will finish the area by installing a concrete slab, flush with the existing cover. The construction of curbs around the slabs will not be required. The contractor will perform inspections and testing at prescribed intervals. The concrete slabs will provide adequate protection from infiltration and effectively eliminate exposure of receptors to residual PCBs in subsurface soil.

POST-REMEDIATION ACTIVITIES

After remediation activities are completed, Witco will provide required documentation to USEPA and NJDEP:

- The USEPA will receive a written summary of the clean-up activities, including major activities, a list of TSCA waste manifests, and results from post-excavation analyses. If any major deviations to the proposed activities occur, USEPA will be notified and acceptance of changed activities will be accepted before proceeding.
- The NJDEP will receive the Remedial Action Report (RAR) for all clean-up activities performed as part of Witco's Stipulation of Settlement. The RAR will comply with the NJDEP Technical Requirements for Site Remediation. A Declaration of Environmental Restriction (DER) will be included with the RAR. The DER will document the residual levels of site contaminants, including PCBs, and provide future site use restrictions in accordance with NJDEP requirements.



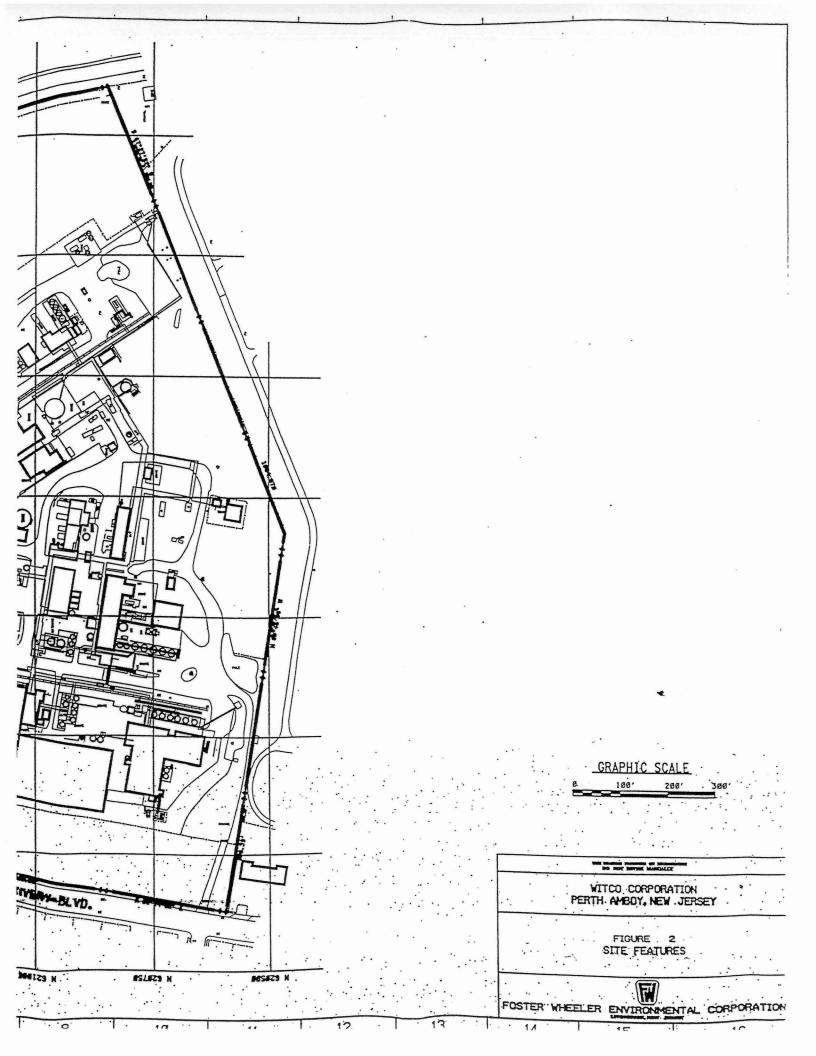


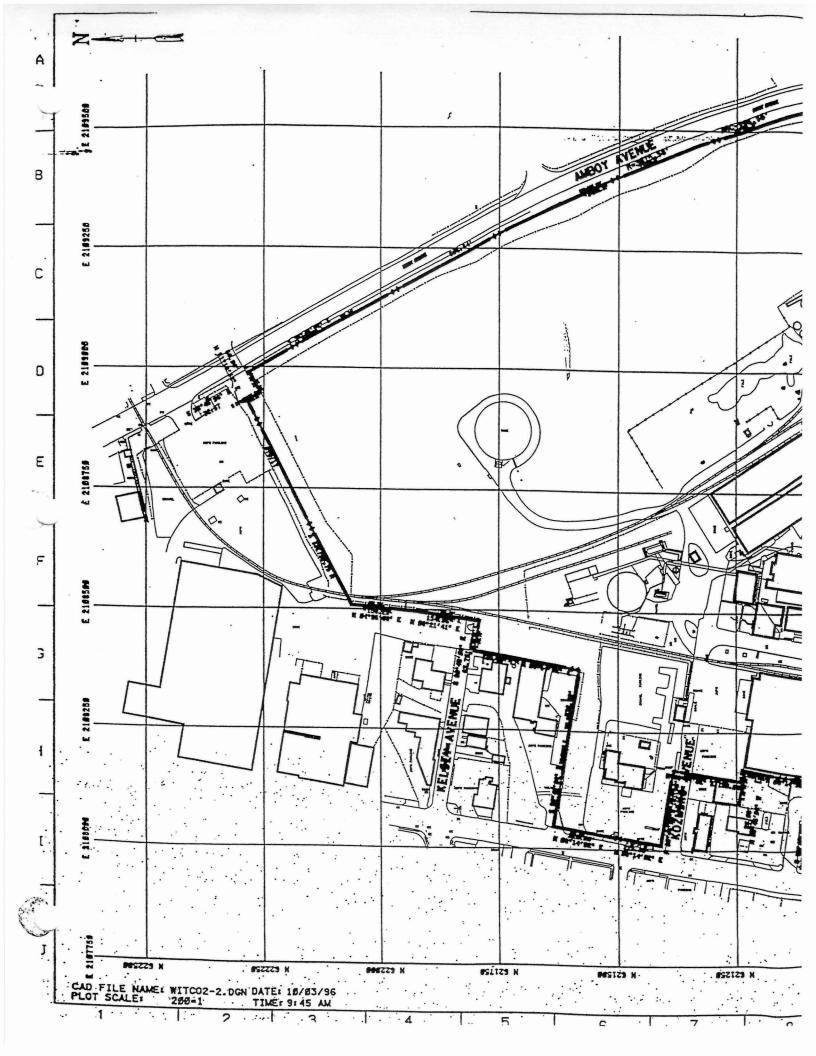
MTCO CORPORATION PERTH AMBOY, NEW JERSEY

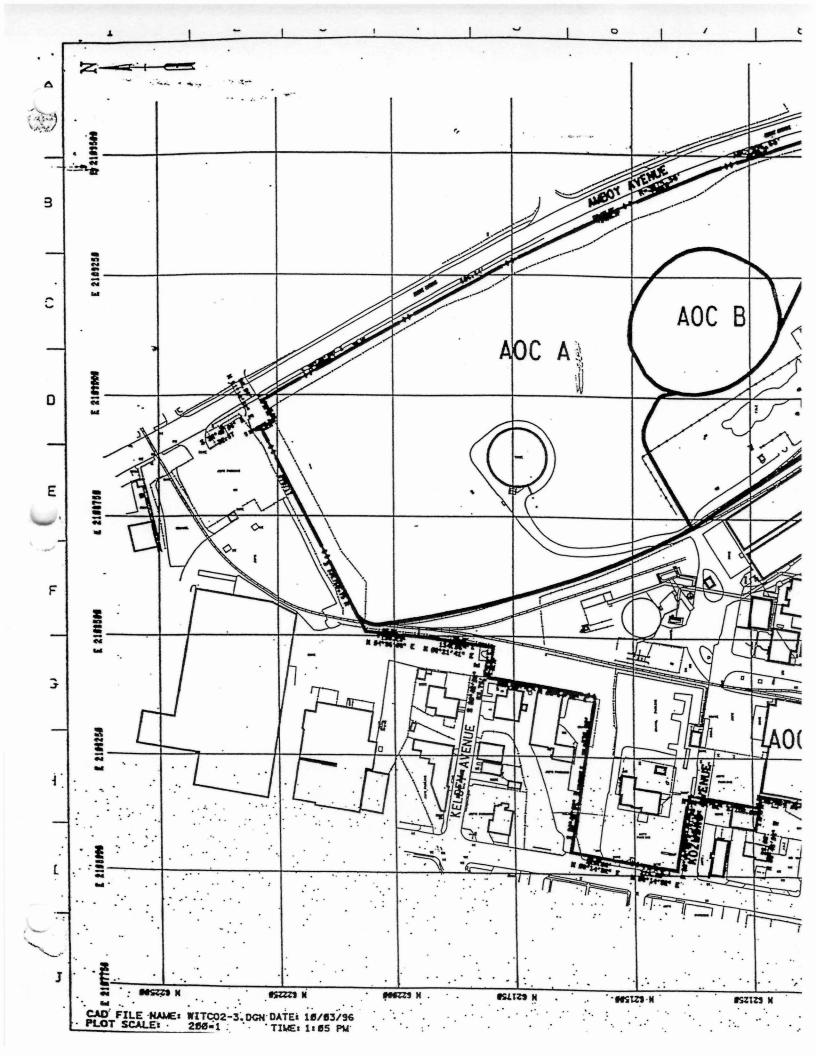
> FIGURE 1 SITE LOCATION

BASE MAP ADAPTED FROM U.S.Q.S. PERTH AMBOY QUADRANGLE, N.I.-N.Y. 7.5 MINUTE SERIES (TOPOGRAPHIC)

FOSTER WHEELER ENVIRONMENTAL CORPORATION







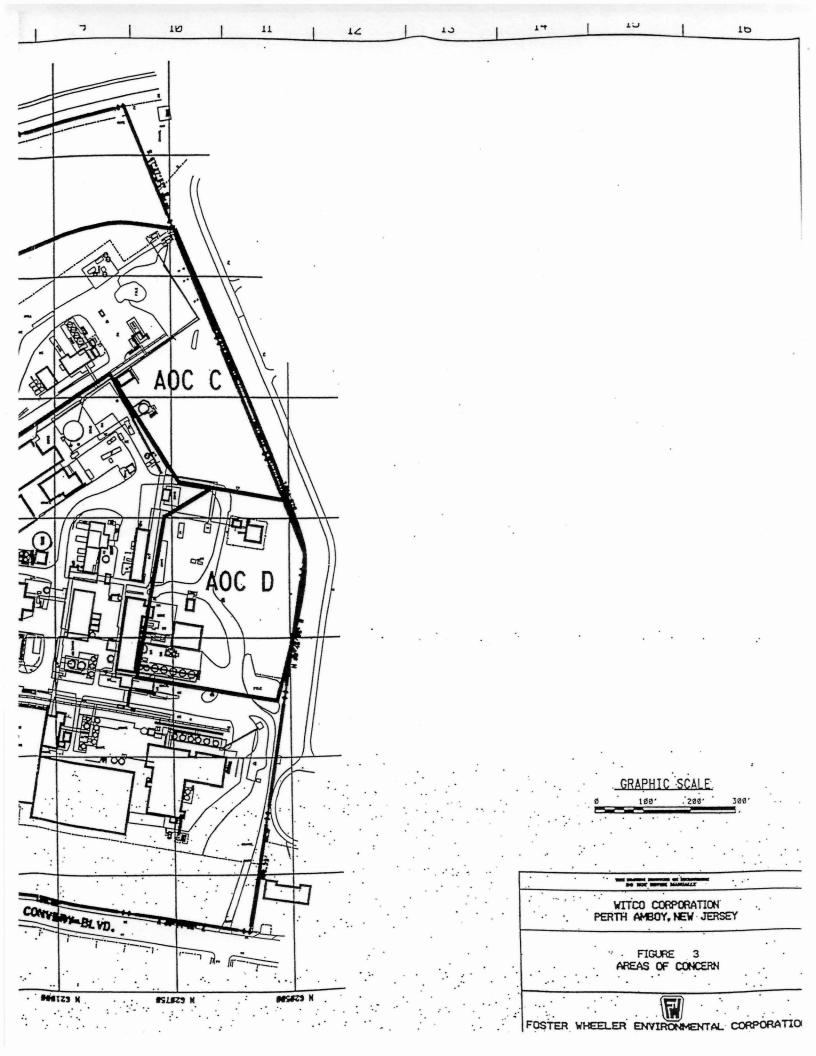


FIGURE 4 CROSS SECTION OF HEATER PAD AREA

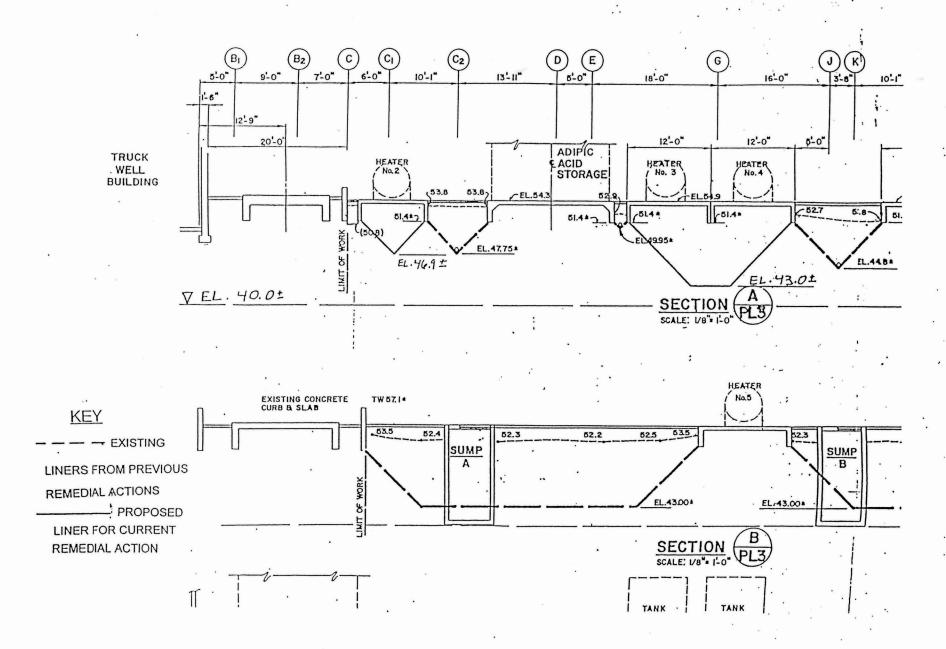


EXHIBIT A-2 CHEMICAL AND GEOTECHNICAL DATA FOR CLEAN BACKFILL





LANDSCAPE MATERIALS INC.

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To! Mike Lacy 732

732 - 826 - 3915

Fax Cover

Date: 2-1:-99

To: Georg: arbotira

From: Some Theore

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Comments:

Thre are the analytical seports on the fill material & slave for your Buth ambey Job.

Thanks Dang

If you do not re :eive all pages please call 908- 252-1550

· Topsoil · Mulch · Stone · Gravel

311 Roycefield Road - Hillsborough, New Jersey 08876 - 908-252-1650 - Fax 908-722-4814





Page: 1 of 4

LLI Sample No. SW . 068323 Collected: 1/7/99 at 10:00 t 10

Submitted: 1/7/99 Reported: 1/13/99 Discard: 1/28/99

#2. Barrier Soil Grab Sample Union Certifole • Soil Remoty Account No: 06598 Four Seasons Environmental, Inc 3107 S. Ele Eugene Street Greensboro NC 27406-3201

P.O. 14790 RET.

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PRY WEIGHT METHOD
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N.D. 0.92
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1.7 0.40
0.0057

1 COPY TO FOUR Seasons Env ormantal .Inc ATTN: Mr. Eric Medito

Quantions? Co :set your Client Services Representative Kathy Klinefeli r et (717) 656-2200 12:62:06 D 000: 2 136947 647667 320 25.00 Ol 65413 ASR000

Respectfully Sutaritied Refer Structo, Jr., B.S. Group Leader, Metals Analysis



Lancaster | borduntes 2/25 New | joined Pine PO But (2 | 15 Lancaster | 17005-2425 777-656-2 20 Pet 717-656-2681

See reverse side for explanation of symbols and abbreviations.

2214 300, 5/4/47





Proc: 2 of 6

Collected: 1/7/99 et 10:00 b III

Submitted: 1/ 7/55 Reported: U/13/99 Discord: 1/28/99

#2 Barrier Soil Grab Sample

Union Carbida - Soil Rassady

Account No: 08398 Four Seasons Environmental, Inc 3107 S. Elm Eugane Street Greensboro NC 27408-5281

P.G. 14790 Rel.

| Union Carbida - Soil Rasady | | DRY WIGHT | | | |
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| ND. AHALYSIS NAME | RESULTS DETECTION LIMIT UNITS | RESULTS DEFECTION LIMIT | | | |
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| 8566 Chierostram Rest Trichlorofischere 8668 1. I-Dichlorostrame | N.D. 4.0 UG/G | N.D. 4.7 N.D. 4.7 N.D. 4.7 N.D. 4.7 | | | |
| 4566 Chloroethere 4568 1. I-Dichloroethere 4568 1. I-Dichloroethere 6569 Methology Chloride 5571 trans-1, 2-Dichloroethere 8572 1. I-Dichloroethere 8573 cis-1, z-Dichloroethere | N.D. 4.0 W0/kg N.D. 4.0 U0/kg M.D. 4.0 U0/kg N.D. 4.0 U0/kg | N.D. 4.7 N.D. 4.7 N.D. 4.7 N.D. 4.7 N.D. 4.7 N.D. 4.7 N.D. 4.7 N.D. 4.7 N.D. 4.7 | | | |
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| 8581 L.2-Pichloroproperte 8584 Trichloroctoperte | N.D. 4.0 UE/AS N.D. 4.0 UE/AS N.D. 4.0 UE/AS H.D. 4.0 UE/AS N.D. 4.0 UE/AS N.D. 4.0 UE/AS | N.P. 4.7 | | | |
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Questions? Co test your Client Services Representative Kathy Klinefel er at (717) 656-2800

Respectfully Submitted Michele Turner, B.A. Moneger, Volatiles



\$435 No. Holland File PO Box 1 25 Lancaster % 17609-2425 717-656- NO. FUL 717-656-2681

Sex reverse side for explanation of symbols and abbreviations.

2316 Mer. 9/4/97





Page: 3 of

LLI Sample No. EW 068323 Collected: 1/7/99 at 10:00 i L

Submitted: 1/7/99 Reported: 1/13/99 Discard: 1/25/99

#2 Barrier Soil Brab Sample

Union Carbide - Sati Restady

Account No: 08395 Four Seasons Environmental, Inc 3107 S. Eth Eugene Street Greensbord NC 27406-5201

P.O. 14790 Nel.

AVALYSIS NEE STEX by SWALE Hethyl t-Butyl Ether Benzene Tolukke Ethylbenzene Haznikalene Xylene (total) 96270

AS RECEIVED
METHOD
LTS DETECTION LIMIT UNITS RESULTS N.D. N.D. N.D. 4.0 200 N.D.

DRY WEIGHT WETHOD

Questioner Co tact your Client Services Representative Rathy Klimetel at (717) 656-2300

Respectfully Submitted Michele Turner, B.A. Manager, Volatiles



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2.225 New Adjusted Pike
PO Bast 12
Lancuster A 19508-2.225
717-555- CO Far 77-455-2581

See reverse side for evolutization of symbols and abbreviations.

2216 NEV. ELAST

LABORATORY CHRONICLE



Page: 4 of 4

Collected: 01/07/99 at 10:00 t DJ

Submitted: 61/07/99

#2 Barrier Scil Grab Sample Union Carbide - Soil Ramidy Account No: 08398 Four Seasons Environmental, Inc 3107 S. Etc Eugene Street Greensboro NC 27408-8201

| CAT | avalysis nhe | . METHOD | TRIAL 10 | DATE AND TIME | ANALYST |
|--|--|--|------------------|---|--|
| 1546 1649 1651 1655 1666 5708 6936 6936 | Barrium Cadrium Chrowium Lead Silver Silver Silver Silver Silver Silver Silver | SN-845 60103 SN-845 60105 SN-845 60105 SN-845 60105 SN-845 60105 SN-845 30505 SN-845 60108 | el pledeled elek | 01/12/99 0554 01/12/93 0565 01/12/93 0569 01/12/99 0455 01/12/99 0865 01/11/99 0566 01/12/99 0559 | Dorme R. Seckett Perekeh K. For Dorme R. Seckett Dorme R. Seckett Dorme R. Seckett |
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| 5711 8430 8433 | Melocarbons by SMB46 SW BTEX by SMB46 | 54-846 60108 54-846 8020A | 1 | 01/08/19 1929 | Gregory D. Pennebaker Bregory D. Pennebaker |
| | Mod sture | EPA 160.3 modified | 1 | 01/10/99 1720 | Elaine F. Stoltafus |



OTO: OU

Lancater Landentes 2425 New cland fike PO Box 124 5 Language: 17605-2425 717-656-2: 10 Fax: 717-656-241

See towerse side for capitanation of symbols and abbreviations.

2218 REV. 8/4/97



FROM : GOLDER-NJ-LAB

TO : 732 549 3679 1999,02-23 11:30 \$167 P.02/04

PARTICLE-SIZE ANALYSIS OF SOILS ASTM D 421, D 422, D 1140, D 2216, D 2217

| TL-ENVIROTE 3-6496-001 | CH/LAB GEO | TECH/NJ | SAMPLE# | L704-113388 | | | |
|---------------------------|---|---------------------|------------|---------------------|---------------|--|--|
| MOIST | TURE CONTENT (D | elivered Moisturc): | 9.28% | | | | |
| MEC | HANICAL SIEV | E | 1 | HYDROMETE | R ANALYSIS | | |
| | SIEVE | PERCENT | | PARTICLE | % FINER | | |
| | SIZE | PASSING | | DIAMETER (mm) | 70 2 22 1 2 2 | | |
| coarse gravel | 3.000" | 100.00% | | 0.028 | 50.65% | | |
| , | 1.500" | 100.00% | 1 | 0.021 | 45.26% | | |
| | 1.000" | 100.00% | | 0.015 | 42.57% | | |
| fine gravel | 0.750" | 100.00% | | 0.011 | 37.72% | | |
| | 0.375" | 99.04% | | 800.0 | 30.17% | | |
| coarse sand | #4 | 92.65% | | 0.006 | 24.79% | | |
| medium sand | #10 | 83.99% |] | 0.004 | 20.47% | | |
| | #20 | 76.53% | | 0.003 | 17.24% | | |
| fine sand | #40 | 71,46% | | 0.002 | 12.93% | | |
| , | #60 | 67.50% | | 0.001 | 10.78% | | |
| | #100 | 65.04% | | ATTERBER | G LIMITS | | |
| fines | #200 | · 62.55% | | LL:[| - | | |
| * | 5-3-3da 5-ya | | | PL: | _ | | |
| | | | | PI: | - | | |
| Coarse Gravel: | 0.00% | | | , | | | |
| Fine Gravel: | 7.35% | Specifi | c Gravity: | 2.65 | (ASSUMEI | | |
| Coarse Sand: | 8.65% | | | | | | |
| Medium Sand: | 12.53% | | | Yellowish red | | | |
| Fine Sand: | 8.91% | D | | Fines, some m sand, | | | |
| Fines: | 62.55% | | | little gravel | ravel | | |
| Total: | 100.00% | | | | | | |
| DESCRIP | TIVE | RANGE (| OF | | | | |
| TERM | <u>s</u> | PROPORT | ION | | | | |
| trace | 3 | 0-5% | | | | | |
| little | *************************************** | 6 - 12 % | | Date: | 2/23/99 | | |
| some | | 13 - 30 % | | Technician: | NM/RDD | | |
| ban | | ≥ 31 % | | Reviewer: | RMW | | |

MT. LAUREL, NEW JERSEY

FROM : GOLDER-NJ-LAB

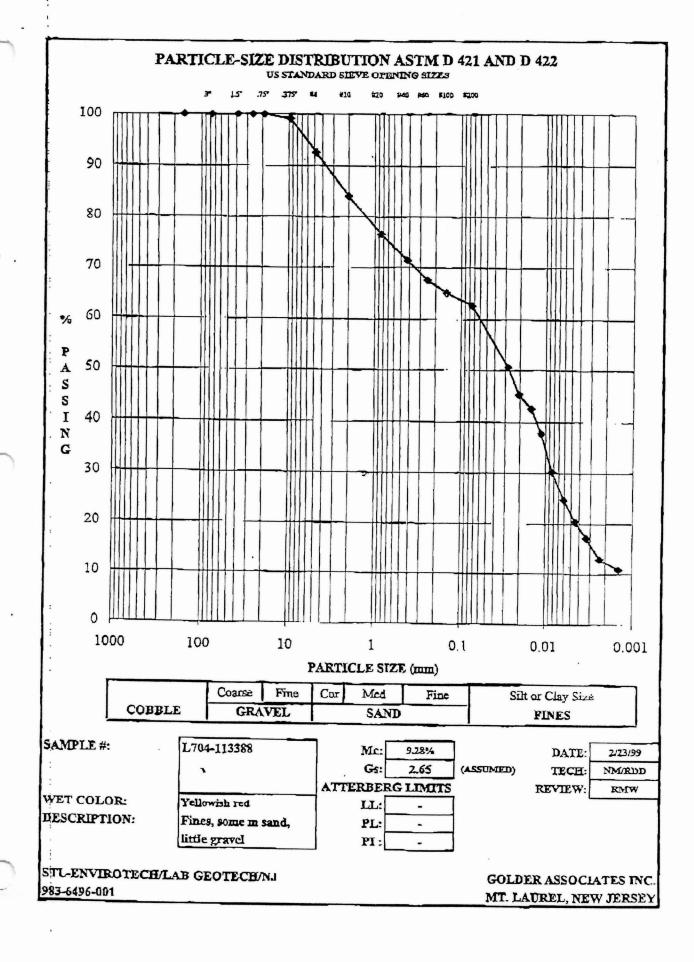
TO

732 549 3679

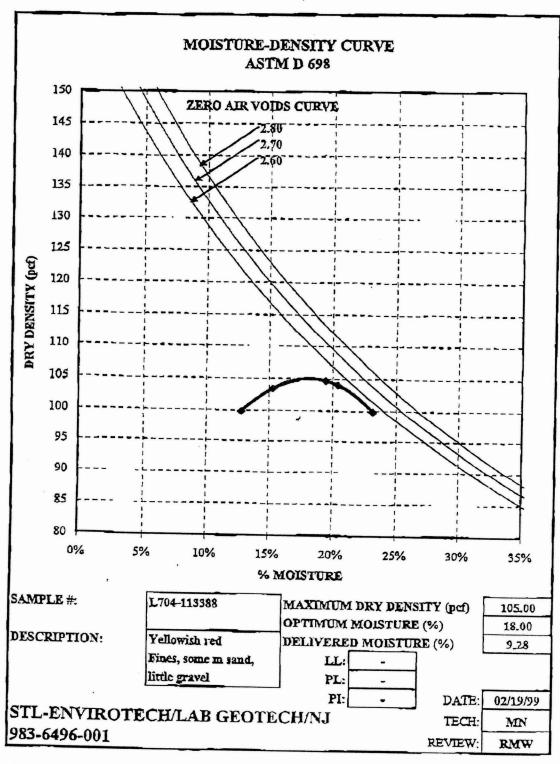
1999,02-23

11:30

#167 P.03/04



11:31



GOLDER ASSOCIATES INC. MT. LAUREL, NEW JERSEY SUMMARY OF IN-PLACE SOIL DENSITY TESTS

| | ROJECT NAME Witto chemical | | | | | | | | | PROJECT NUMBER 51-99305-01 | | | |
|---|--------------------------------|-----------------------|-----------------------------------|--------------------------|-----|------------|-----------|---------------------------------------|--------------------------|----------------------------|-----|-----------------------|--------------------------|
| PROJECT LOCATION Perth Amboy NJ EARTHWORK CONTRACTOR IT Cosp. | | | | | | | | | DATE 2-25-99 PAGE 5 OF 5 | | | | |
| DRY DENSITY PCF | PERCENT MOISTURE CONTENT | PERCENT Compaction | PERCENT COMPACTION REGUNRED | PROCTOR TEST USED* | | | | LOCATION | | | | EVATION OF TEST | COMMENTS |
| 67.0 | 18.3 | 82.7 | 857. | A | Sou | th Side | of the | Polyester b | uildin | 9 | - | 8" | Retest See Next Entry |
| 930 | 18.9 | 88.6 | | | Con | nplex | OUPUS | * 2′ | - |) | | | i i |
| .109.5 | 21.7 | 85.7 | | | | 1 | | | | | | | |
| 87.7 | 23.0 | *83,5 | | | | | | | | | | | Rotest SPP Next entry |
| 94.6 | 18.3 | 90.1 | V | | | | | | | | | / | |
| 96.0 | 13.3 | 91.5 | | | OV- | en# 2 | 4.5 | , | | | - 3 | 0" | |
| 96.4 | 10.4 | 91.8 | | | | | | | | | | | |
| 99.1 | 11.8 | 94,4 | | | | | | | | | | | |
| 102.0 | 11.6 | 97.1 | | | | | | - | | | | | |
| 99.6 | 12.4 | 94.9 | | | | | | · · · · · · · · · · · · · · · · · · · | | | | | |
| 103, | 11.3 | 98.1 | | | | | | | | | -/ | 0" | |
| 89.5 | 13.9 | 85,2 | | | | | | | | | | | |
| 103.1 | 12.3 | 98.2 | | | | | | | | | | | |
| 102,2 | 11.5 | 97.3 | | | | | | | | | _ | | |
| 99.5 | 12,4 | 94.7 | | 1 | | | 1 | | | | _ | | |
| Holo: Proct | er result | s supplied b | 2 <u>y</u> | PROCTOR TY | Æ | *PROCTOR | EST DESIG | ENATION: | | A | T | | |
| Note: Procter results supplied by OHM /IT COSP. 2-19-99 | | | 9 | STANDARD M | | MAXIMUM DI | ry Densit | Y (PCF): | | 105.0 | 7 | | |
| | | | | | | OPTIMUM M | ISTURE (1 | 6): | | 18,0 | | | |

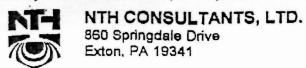
SUMMARY OF IN-PLACE SOIL DENSITY TESTS

| PROJECT N | AME WITCO | Chemical | | | | | | PROJECT NUMBER 51-99305-01 | | | | | |
|--------------------------|--------------------------------|-----------------------|-----------------------------------|--------------------------|-----------------------|-------------------|-----------------|---|------|------|----------|----------------------|-------------------------|
| PROJECT LO | CATION_P | rin Ambay | NI | * | | | | DATE_ 2 - | 25-9 | 9 | | | |
| | | R It cor | | | | | | PAGE | 3 | OF | 7 | | |
| | | | 1 | | | | | | | | | | |
| DRY Dexitity [PCF] | PERCENT MONSTURE CONTENT | PERCENT COMPACTION | PERCENT COMPACTION REQUIRED | PROCTOR TEST USED* | | tomining Light | LOCA | TION | | | | VATION OF TEST | COMMENTS |
| 90,6 | 16.1 | 86.3 | 85,09 | 70 A | L | oven = | ± 2 | | | | - 4 | 40" | |
| 90.7 | 12.6 | 86,4 | | 1 | | Ì | ` | | | | | | |
| 96.1 | 12,5 | 915 | | | | | | | | | | | *1 |
| 94,2 | 15.4 | 89,7 | | | | | | | | | | | |
| 92.9 | 128 | 88.5 | | | | | | | | | | L | |
| 89.6 | 16.6 | 85.3 | | | | | | | | | 1- | 240 | |
| 91.9 | 16. | 87.5 | | | | | | | | | | | 1-1-1-1-1-1 |
| 88,1 | 15.0 | 183,9 | | | <u></u> | | | | | | | <u> </u> | letast see nat entry |
| 89.4 | 19,4 | 85,2 | | | | | | | | | 1 | <u> </u> | Ketist see |
| 87.0 | 18,0 | *62.8 | | | | | | | | | | | west entry |
| 95.5 | 16.7 | 90,9 | | | | | | | | | 1-1 | | |
| 95.3 | 15.7 | 90.8 | | | ļ | | | | | | | | |
| 91.0 | 21.8 | 86.7 | | | ļ | | | | | | <u> </u> | <u> </u> | |
| 92.1 | 1512 | 87.7 | | | ļ | | | | | | | 18" | |
| 89.2 | 18.7 | 89.7 | 7 | <u> </u> | | | <i>Y</i> | | | | Ш, | L | |
| Hole: Proc | ler Result | supplied ated 2-19. | by | PROCTOR TY | | *PROCTO | R TEST DESIGNAT | TION: | | A | | | |
| DHM/I | T Corp. de | ated 1-19 | - 47 | | X STANDARD MODEFED | | DRY DENSITY (P | CF): | | 105. | D | | |
| | | | | | | OPTIMUM | MOISTURE (%): | 21 11 00 0 0 00 00 00 00 00 00 00 00 00 0 | | 18.0 |) | | |
| | | | | | | | | 1 1 | | | | | |



DAILY FIELD REPORT

| PROJECT NAME WITCO Chemical PROJECT LOCATION PETT Am pay NJ EQUIPMENT ON SITE VISITORS ON SITE | PROJECT NO. <u>5/-99305-0/</u> DATE <u>2-25-99</u> PAGE 2 OF <u>4</u> |
|--|---|
| A NTH Representive at the above listed | d site Toperbin |
| Backfilling occurred at Two Locations of the polyester hailding complex. Oven # 2 The 1th lift. This lift was not observed by a | area already contained |
| ALL the lifts were in 18" levels and co the bucket of the track hoe or a plate to Excavated areas (oven # 2,3.45) were co | mpacted with either amper. Both om pleted up to |
| finish grade which was - 83. For further attached sheets, | details see |
| | |
| | |
| | |
| REPORT PREPARED BY: Kenth Salvey W | |



DAILY FIELD REPORT

| PROJECT NAME WITCO CHEMICAL PROJECT LOCATION PETH Amboy NJ CLIENT IT OHM CORP. CLIENT'S REPRESENTATIVE(S) MIKE LOCY, Todd King CONTRACTOR'S REPRESENTATIVE(S) MIKE LOCY CONTRACTOR'S REPRESENTATIVE(S) MIKE LOCY | | | | | PROJECT NO. 51-99305-01 DATE 2-25-99 WEATHER COID, Cloudy 35-90° PAGE 1 OF 4 REPORT NO. 2 TIME ON SITE 7:00 TO 3:45 | | | |
|---|---|------------|--------------------|-----------------------------|---|---|----------------|--|
| Profession and the second | TASK | | - ukona su | LOCATION | SATE | BFACTORY | UNGATISFACTORY | |
| | KAND SUBGRADE PREPA | RATION | 1.0 | | ``` | | | |
| Excavation | | | - L | | | ., | - | |
| FIN | | BUER | 15 = 2 - 5 | 5 -408° | | × | | |
| Proofnolling | | | · · · | | | X | | |
| UTILITY COM | STRUCTION | | | , | | | 1 | |
| Excavation | ******************************* | | | | | | | |
| Pipe Bedding | & Joints | | | | | | | |
| Backfill | | | | | | | l | |
| FOUNDATIO | N CONSTRUCTION | | | J | | | | |
| Excavation | | | | | | | | |
| Beackfill | - This dogs V | | 43 | | | | | |
| STRUCTURA | LCONCRETE | | | | | * ** ** * * * * * * * * * * * * * * * | | |
| Reinforcing 9 | tool | | | | | | | |
| Placement | | | | | | | | |
| BITUMINOUS | AND CONCRETE PAVEME | ENT: | × | 100 | <u> </u> | £* . | | |
| Placement & | Compaction | | | | | | | |
| STRUCTURA | L STEEL ERECTION | 8 . Y. v Y | *** | | * | , at the | | |
| Framing | | И | | | | | | |
| Decking | | | | | | | | |
| ATTACHMEN | | | | | ************************************** | 300000000000000000000000000000000000000 | | |
| NUMBER OF ITEMS | ATTACHMENT | | NUMBER OF ITEMS | ATTACHMENT | NUMBER OF ITEMS | , A | TTACHMENT | |
| | Field Sketch(es) | | | Dally Concrete Report(s) | | Pile Driving I | Record(s) | |
| 2 | Summary of in-Place Deni Test Results | sity | | Concrete Delivery Ticket(s) | | Other: | | |
| | Foundation Construction Caisson Inspection Report(s) Other: | | | | | | | |
| REPORT PREP | ARED BY: Lea | F. | Aubls | 2/26/19 | 7 | 4 | | |

SUMMARY OF IN-PLACE SOIL DENSITY TESTS

| PROJECT LO | CATION PE | the Amba | Tu, y | | | PROJECT NUMBER 5/ DATE 2-24-9 PAGE 3 | 9 | | |
|------------------------|--------------------------------|--|-----------------------------------|-------------------------|------------------------|--------------------------------------|-------|-------------------------|--|
| DRY Designy PCF) | PERCENT MOISTURE CONTENT | PERCENT COMPACTION | PERCENT COMPACTION REQUIRED | PROCTOR TEST USED | | DCATION. | | ELEVATION DF TEXT | COMMENTS |
| 92.1 | 12.5 | 87.7 | 85% | A | South of the Polyest | er building compl | ex | - 18" | |
| 90.7 83.4 | 11.7 | 86.3 *79.4 | 1- | | ovens 4,5 | 1 ' | | 1 | factor see not early terompacted sec next reg |
| 83.4 | 13,2 | + 79. 5 | | | | | | -6" | terompacted see next tec |
| 90.9 | 11.5 | 86,6 | | | | | | | |
| 92.1 | 15.0 | 87.7 | | | | | | | |
| 92.1 | 12.5 | 87.7 | - V | ↓ | ↓ | | | <u> </u> | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| • | | | | | | | | | |
| | | | | | · | | | | |
| | | | | | | | | | · |
| | | | | | | | | - | |
| Hote: Proc | or Result | s supplied | by | PROCTOR TY | | NATION: | A | | |
| -UHM/I | Colf. | , dofted 2/ | 19 [19 | STANDA MODIFE | I MAYBAHA DARY DENSITY | (PCF): | 105.0 | | |
| | | | | MODB R | OPTIMUM MOISTURE (N |); | 18.0 | | |
| | | A STATE OF THE STA | | | CELD DEDOCCEMENTAL AND | Yest Muly | 11 | | |



| | VI | DE | DART |
|------|------|--------|------|
| DAIL | _Y F | KE | PORT |

| PROJECT NAME Witco Clemical | PROJECT NO. 51-99305-01 |
|--|---------------------------|
| PROJECT LOCATION Perth Amboy NJ | DATE 2-14-99 |
| EQUIPMENT ON SITE | PAGE 2 OF 3 |
| VISITORS ON SITE | |
| An NTH Representive on site to perfe | im moisture-density |
| Testing. | |
| , | |
| Upon arrival on site an area exeavar | ted on the south |
| side of the polyester building complex wi | ere ovens #2,3,4,5 |
| ONTESTOOD Was completed half way. This a | rea (10 1 15 15) of soil |
| pacement was in an 18" + Lift and compac | ted with a nuclet of |
| a trackhor. Another 10'x15' torea we | s backfilled with an 18". |
| Litt and compacted with the bucket of atro | |
| see cittached report for Further details | |
| | |
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| | , |
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| | |
| | |
| REPORT PREPARED BY: Kent Yuku | |
| G.YFDAWSIGEOTECHOFR FRM | |



NTH CONSULTANTS, LTD. 860 Springdale Drive Exton, PA 19341

DAILY FIELD REPORT

| | | | ALL TILLD KLIOKI | | | | |
|--------------------|--|---|--|----------------------------|---|--|--|
| PROJECT NA | ME Witco Ch | mical | _ | _ PROJECT NO | 51-99 | 3056-01 | |
| PROJECT LO | OCATION POPHE AN | nboy iv | | DATE 2-24-99 | | | |
| CLIENT_ I | T COCD. | • | | WEATHER SBANKY COLD, WINDY | | | |
| CLIENTS RE | PRESENTATIVE(S) M. | Ke Lacy, | Todd King | 40'5 | | | |
| CONTRACTO | R IT COSP | | / | _ PAGE 1 | OF | 3 | |
| | OR'S REPRESENTATIVE(S)_ | mike La | cy | _ REPORT NO | | | |
| | | A second | The second secon | TIME ON SIT | E 9130 T | 0_/:30 | |
| | TASK | | LOCATION | SATE | FACTORY | UNSATISFACTORY | |
| EARTHWOR | K AND SUBGRADE PREPA | RATION :: | | | • | | |
| Excavation | | | | | | | |
| Fin | | 10 ± x 15 ± x 8 | Lists ovens | -51 x | | | |
| Proofrolling | | ti t | · |) | | | |
| UTILITY CON | ISTRUCTION | | | i k | | | |
| Excavation | | | | | | | |
| Pipe Bedding | & Joints | | | | | | |
| Backfill | | | | | | | |
| FOUNDATIO | N CONSTRUCTION | | · . | | | | |
| Excavation | | | | | | | |
| Backfill | | | | | | | |
| STRUCTURA | LE CONCRETE | 3 · · · · · · · · · · · · · · · · · · · | * | e a an sens _a | 3 N 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 | | |
| Reinforcing S | toni | | | | | | |
| Placement | | | · | | | | |
| BITUMINOUS | AND CONCRETE PAVEME | NT. | . 1 | ,% | | | |
| Placement & | Compaction | | | | | | |
| STRUCTURA | L STEEL ERECTION | | *** **** **** **** | To a section | , X Y | | |
| Framing | | | * | | | | |
| Decking | | | | | | | |
| ATTACHME | NTS | | | | | ************************************** | |
| NUMBER OF ITEMS | ATTACHMENT | NUMBER OF ITEMS | ATTACHMENT | NUMBER OF ITEMS | AT. | TACHMENT | |
| | Field Sketch(es) | | Daily Concrete Report(s) | | Pile Driving Re | ecord(s) | |
| l | Summary of In-Place Dens Test Results | ity | Concrete Delivery Ticket(s) | | Other: | | |
| * | Foundation Construction Report(s) | | Caisson Inspection Report(s) | | Other: | | |
| REPORT PREPARENTED | ARED BY: | end Jubl | 2 26199 | | | | |

Data File: /chem/BNAMS3.i/8270/02-12-99/16feb99A.b/t2669.d

Page 1

QUANTITATION

Report Date 02/17/1999 16:32

: Fill Material Client ID

: 113388 Lab ID

: /chem/BNAMS3.i/8270/02-12-99/16feb99A.b/8270C.m Method ..

: BNAMS3.i Inst ID

: 17-FEB-1999 00:06 Dil Factor Inj Date 10.00% * Moisture

Sample Matrix : SOIL
Sample Weight : 30 30 g

..2.0 ml Extract Final Volume:

RUSH DATA RESULTS SEMI-VOLATILE ORGANICS - GC/MS

| Parameter | Result Units: ug/Kg | LIMIT Units: ug/Kg |
|-------------------------------|--------------------------|-----------------------|
| | 21 J | 370 |
| Phenol | ND | 370 |
| 2-Chlorophenol | ND | 370 |
| 2-Methylphenol | ND | 370 |
| 4-Methylphenol | ND | 370 |
| 2-Nitrophenol | ND | 370 |
| 2,4-Dimethylphenol | ИD | 370 |
| 2,4-Dichlorophenol | ND | 370 |
| 4-Chloro-3-methylphenol | , ND | 370 |
| 2,4,6-Trichlorophenol | · · | 370 |
| 2,4,5-Trichlorophenol | ND | 1500 |
| 2,4-Dinitrophenol | . D | 1500 |
| 4-Nitrophenol | מא | |
| 4,6-Dinitro-2-methylphenol | ND | 1500 |
| Pentachlorophenol | ND | 1500 37 |
| bis (2-Chloroethyl) ether | , ND | |
| 1;3-Dichlorobenzens | ND | 370 370 |
| 1,4-Dichlorobenzene | ND | 370 |
| 1,2-Dichlorphenzene | ND | 370 |
| bis (2-chloroisopropyl) ether | ND . | |
| N-Nitroso-di-n-propylamine | ND . | 37 |
| Hexachloroethane | ND . | 37 |
| Nitrobenzene | ND | 37 |
| Isophorone | ND . | 370 |
| bis(2-Chloroethoxy) methane | ND | 370 |
| 1,2,4-Trichlorobenzene | ND | 37 |
| Naphthalene | 170 J | 370 |
| 4-Chloroaniline | ND | 370 |
| Hexachlorobutadiene | ND | 74 |
| 2-Mathylnaphthalene | . 12 0 J . | 370 |
| Hexachlorocyclopentadiene | ND | 370 |
| 2-Chloronaphthalene | ND | 370 |
| 2-Nitroaniline | ND | 740 |
| Dimethylphthalate | ND | 370 |
| Acenaphthylene | . 34 Л | 370 |
| 2,6-Dinitrotoluens | , ND | 74 |
| 3-Nitroaniline | ND | 740 |

Data File: /chem/BNAMS3.1/8270/02-12-99/16feb99A.b/t2669.d Report Date 02/17/1999 16:32

: Fill_Material Client ID

: 113388 Lab ID

NX/TI/AR TI:TE LUV INT AND MAIL

: /chem/BNAM53.1/8270/02-12-99/16feb99A.b/8270C.m Method

: BNAMS3.i Inst ID.

: 17-FEB-1999.00:06 Dil Factor Inj Date

10.00% & Moisture Sample Matrix : SOIL

Sample Weight: 30 g

2.0 ml Extract Final Volume:

RUSH DATA RESULTS SEMI-VOLATILE ORGANICS - GC/MS

| Parameter | | Result Units: ug/Kg | | QUANTITATION LIMIT Unics: ug/Kg |
|------------------------------|-------|------------------------|-------------|---------------------------------------|
| | * | | | |
| Acenaphthene | | 40 | J | 370 |
| Dibenzofuran | | ND | | 370 |
| 2,4-Dinitrotoluene | | , ND | twi | 74 |
| Diethylphthalate | | ND | ×. | 370 |
| 4-Chlorophenyl-phenylather | | ND | | 370 |
| Fluorene | * | 46 | J | 370 |
| 4-Nitrozniline | | ND | | . 740 |
| N-Nitrosodiphenylamine | | , ND | | 370 |
| 4-Bromophenyl-phonylether | | , ND | - | 370 |
| Hexachlorobenzene | | ND | | . 37 |
| Phenanthrene | * | 190 | J | 370 |
| Anthracene | | 44 | J | 370 |
| Carbazole | *, | ND | | 370 |
| | | , MD | | 370 |
| Di-n-butylphthalate | | 130 | J | 370 |
| Fluoranthene | | 170 | . <u></u> . | 370 |
| Pyrene | * | ND | | 370 |
| Butylbenzylphthalate | | ND | | 740 |
| 3,3'-Dichlorobenzidine | | 83 | | 37 |
| Benzo (a) anthracene | | 77 | J | 370 |
| Chrysene | | ND | 7 | 370 |
| bis (2-Ethylhexyl) phthalate | | ND | | 370 |
| Di-n-octylphthalate | | 67 | | 37 |
| Benzo(b) fluoranthena | * * * | 27 | J | 37 |
| Benzo(k) fluoranthene | * , * | 7.0. | _ | 37 |
| Benzo (A) pyrene | | 37 | J · · | 37· |
| Indeno(1,2,3-rd)pyrene | | 12 | <u>.</u> | 37 |
| Dibenz (a, h) anthracens | | 45 | J | 370 |
| Benzo (q, h, i) perylene | | 7.0 | _ | 3,1 |

Data File: /chem/BNAMS3.1/8270/02-12-99/16feb99A.b/t2669.d Report Date: 17-Feb-1999 16:32

STL Envirotech

TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: 123
Lab Smp Id: 113388
Operator: BNAM63
Sample Location: Witco
Sample Matrix: SOIL
Analysis Type: SV

Number TICs found: 3

Client SDG: L704
Client Smp ID: Fill_Material
Sample Date: 02/16/99
Sample Point: 5116
Date Received:02/16/99
Level: LOW

CONCENTRATION UNITS: (ug/L or ug/KG) ug/Kg

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|-------------|---------------|--------|------------|----|
| 1. 511-15-9 | Totarol | 23.631 | 550 | _J |
| 2. | Unknown | 25.607 | 300 | |
| 3. | C20H42 Alkane | 29.414 | 360 | |

Envirotech

Client ID: BF-01

Site: Witco

Lab Sample ID: **114612** Lab Job No: L898

Date Sampled: 02/23/99
Date Received: 02/23/99
Date Extracted: 02/25/99
Date Analyzed: 02/28/99

Date Analyzed: 02/28/99 GC Front Column: DB-5 GC Rear Column: DB-608 Instrument ID: PESTGC7.i

Instrument ID: PESTGC7.i Front File ID: of007798.d Rear File ID: or007798.d Matrix: SOIL Level: LOW

Sample Weight: 15 g

Extract Final Volume: 10.0 ml

Dilution Factor: 1.0

% Moisture: 18

| <u>Parameter</u> | Analytical Results Units: ug/kg <u>(Dry Weight)</u> | Quantitation Limit <u>Units: ug/kg</u> | <u>Column</u> |
|--|---|--|---------------|
| Aroclor-1016 Aroclor-1221 Aroclor-1232 Aroclor-1242 Proclor-1248 Proclor-1254 Aroclor-1260 Aroclor-1362 Aroclor-1268 | ND | 82 82 82 82 82 82 82 82 82 | RREERREER |



Client ID: BF-02

Site: Witco

Date Sampled: 02/23/99 Date Received: 02/23/99

Date Extracted: 02/25/99

Date Analyzed: 02/28/99 GC Front Column: DB-5 GC Rear Column: DB-608

Instrument ID: PESTGC7.i Front File ID: of007799.d Rear File ID: or007799.d Lab Sample ID: 114613

Lab Job No: L898

Matrix: SOIL Level: LOW

Sample Weight: 15 g

Extract Final Volume: 10.0 ml

Dilution Factor: 1.0

% Moisture: 13

| <u>Parameter</u> | Analytical Results Units: ug/kg (Dry Weight) | Quantitation Limit <u>Units: ug/kg Column</u> |
|--|--|--|
| Aroclor-1016 Aroclor-1221 Aroclor-1232 Aroclor-1242 Aroclor-1248 Aroclor-1254 Aroclor-1260 Aroclor-1262 Aroclor-1268 | ND ND ND ND ND ND ND ND | 77 R 77 R 77 R 77 R 77 R 77 R 77 R 77 R |

EXHIBIT A-3 STL ENVIROTECH POST-EXCAVATION SAMPLING DATA PACKAGE



Client ID: WCFBH-P2

Site: Witco

Lab Sample ID: 112805

Lab Job No: L612

Date Sampled: 02/11/99 Date Received: 02/11/99 Date Extracted: 02/16/99

Date Analyzed: 02/20/99

GC Column: DB-608

Instrument ID: PESTGC4.i

Matrix: WATER

Sample Volume: 920 ml Extract Final Volume:

5.0 ml

Dilution Factor: 1.0 Lab File ID: wr018981.d

| Parameter Analytical Units: | | Method Detection Limit <u>Units: ug/l</u> |
|-----------------------------|----|---|
| Aroclor-1016 | ND | 0.20 |
| Aroclor-1221 | ND | 0.30 |
| Aroclor-1232 | ND | 0.40 |
| Aroclor-1242 | ND | 0.30 |
| Aroclor-1248 | ND | 0.30 |
| Aroclor-1254 | ND | 0.40 |
| Aroclor-1260 | ND | 0.20 |
| _roclor-1262 | ND | 0.20 |
| roclor-1268 | ND | 0.20 |



Client ID: WCH201

Site: Witco

Date Sampled: 02/11/99 Date Received: 02/11/99 Date Extracted: 02/15/99 Date Analyzed: 02/19/99 GC Front Column: DB-5

GC Rear Column: DB-608 Instrument ID: PESTGC7.i Front File ID: of007569.d Rear File ID: or007569.d

Lab Sample ID: 112806

Lab Job No: L612

Matrix: SOIL Level: LOW

Sample Weight: 15 g Extract Final Volume:

10.0 ml

Dilution Factor: 50.0

% Moisture: 17

| <u>Parameter</u> | Analytical Results Units: ug/kg (Dry Weight) | Quantitation Limit <u>Units: ug/kg</u> | Column |
|------------------|--|--|--------|
| Aroclor-1016 | ND | 4000 | R |
| Aroclor-1221 | ND | 4000 | R |
| Aroclor-1232 | ND | 4000 | R |
| Aroclor-1242 | ND | 4000 | R |
| roclor-1248 | 72000 | 4000 | R |
| coclor-1254 | ND | 4000 | R |
| Aroclor-1260 | ND | 4000 | R |
| Aroclor-1262 | ND | 4000 | R |
| Aroclor-1268 | ND | 4000 | R |



crient ID: WCH202

Site: Witco

Date Sampled: 02/11/99 Date Received: 02/11/99 Date Extracted: 02/15/99 Date Analyzed: 02/19/99

GC Front Column: DB-5 GC Rear Column: DB-608 Instrument ID: PESTGC7.i Front File ID: of007565.d Rear File ID: or007565.d

Lab Sample ID: 112807 Lab Job No: L612

Matrix: SOIL Level: LOW

Sample Weight: 15 g

Extract Final Volume: 10.0 ml

Dilution Factor: 500.0

% Moisture: 22

| <u>Parameter</u> | Analytical Results Units: ug/kg (Dry Weight) | Quantitation Limit <u>Units: ug/kg</u> | Column |
|------------------|--|--|--------|
| Aroclor-1016 | ND | 43000 | R |
| Aroclor-1221 | ND | 43000 | R |
| Aroclor-1232 | ND | 43000 | R |
| Aroclor-1242 | ND | 43000 | R |
| Troclor-1248 | 740000 | 43000 | R |
| oclor-1254 | ND | 43000 | R |
| coclor-1260 | ND | 43000 | R |
| Aroclor-1262 | ND | 43000 | R |
| Aroclor-1268 | ND | 43000 | R |



lient ID: WCH203

Site: Witco

Date Sampled: 02/11/99 Date Received: 02/11/99

Date Extracted: 02/15/99
Date Analyzed: 02/19/99
GC Front Column: DB-5
GC Rear Column: DB-608 Instrument ID: PESTGC7.i

Front File ID: of007570.d Rear File ID: or007570.d

Lab Sample ID: 112808

Lab Job No: L612

Matrix: SOIL Level: LOW

15 g Sample Weight:

10.0 ml Extract Final Volume:

Dilution Factor: 5.0

% Moisture: 20

| <u>Parameter</u> | Analytical Results Units: ug/kg (Dry Weight) | Quantitation Limit <u>Units: ug/kg</u> | Column |
|------------------|--|--|--------|
| Aroclor-1016 | ND | 420 | R |
| Aroclor-1221 | ND | 420 | R |
| Aroclor-1232 | ND | 420 | R |
| Aroclor-1242 | ND | 420 | R |
| Aroclor-1248 | 7100 | 420 | F |
| roclor-1254 | ND | 420 | R |
| coclor-1260 | ND | 420 | R |
| Aroclor-1262 | ND | 420 | R |
| Aroclor-1268 | ND | 420 | R |



lient ID: WCH204

Site: Witco

Date Sampled: 02/11/99
Date Received: 02/11/99

Date Extracted: 02/15/99 Date Analyzed: 02/19/99 GC Front Column: DB-5 GC Rear Column: DB-608

Instrument ID: PESTGC7.i Front File ID: of007567.d Rear File ID: or007567.d Lab Sample ID: 112809

Lab Job No: L612

Matrix: SOIL Level: LOW

Sample Weight: 15 g

Extract Final Volume: 10.0 ml

Dilution Factor: 100.0

% Moisture: 23

| <u>Parameter</u> | Analytical Results Units: ug/kg (Dry Weight) | Quantitation Limit <u>Units: ug/kg</u> | <u>Column</u> |
|------------------|--|--|---------------|
| Aroclor-1016 | ND | 8700 | R |
| Aroclor-1221 | ND | 8700 | R |
| Aroclor-1232 | ND | 8700 | R |
| Aroclor-1242 | ND | 8700 | R |
| Aroclor-1248 | 200000 | 8700 | R |
| coclor-1254 | ND | 8700 | R |
| roclor-1260 | ND | 8700 | R |
| Aroclor-1262 | ND | 8700 | R |
| Aroclor-1268 | ND | 8700 | R |



Client ID: WCH205

Site: Witco

Date Sampled: 02/11/99
Date Received: 02/11/99

Date Extracted: 02/15/99

Date Analyzed: 02/19/99 GC Front Column: DB-5

GC Rear Column: DB-608 Instrument ID: PESTGC7.i Front File ID: of007566.d Rear File ID: or007566.d Lab Sample ID: 112810

Lab Job No: L612

Matrix: SOIL Level: LOW

Sample Weight: 15 g

Extract Final Volume: 10.0 ml

Dilution Factor: 500.0

% Moisture: 28

| <u>Parameter</u> | Analytical Results Units: ug/kg (Dry Weight) | Quantitation Limit <u>Units: ug/kg Column</u> |
|------------------|--|---|
| Aroclor-1016 | ND | 46000 R |
| Aroclor-1221 | ND | 46000 R |
| Aroclor-1232 | ND | 46000 R |
| Aroclor-1242 | 900000 | 46000 R |
| Aroclor-1248 | ND | 46000 R |
| roclor-1254 | ND | 46000 R |
| .roclor-1260 | ND | 46000 R |
| Aroclor-1262 | ND | 46000 R |
| Aroclor-1268 | ND | 46000 R |



_ient ID: WCH206

Site: Witco

Date Sampled: 02/11/99
Date Received: 02/11/99

Date Extracted: 02/15/99

Date Analyzed: 02/19/99 GC Front Column: DB-5 GC Rear Column: DB-608

Instrument ID: PESTGC7.i Front File ID: of007568.d Rear File ID: or007568.d Lab Sample ID: 112811

Lab Job No: L612

Matrix: SOIL Level: LOW

Sample Weight: 15 g

Extract Final Volume: 10.0 ml

Dilution Factor: 100.0

% Moisture: 17

| <u>Parameter</u> | Analytical Results Units: ug/kg (Dry Weight) | Quantitation Limit Units: ug/kg | Column |
|------------------|--|---------------------------------------|--------|
| Aroclor-1016 | ND | 8100 | R |
| Aroclor-1221 | ND | 8100 | R |
| Aroclor-1232 | ND | 8100 | R |
| Aroclor-1242 | ND | 8100 | R |
| Aroclor-1248 | 130000 | 8100 | R |
| roclor-1254 | ND | 8100 | R |
| coclor-1260 | ND | 8100 | R |
| Aroclor-1262 | ND | 8100 | R |
| Aroclor-1268 | ND | 8100 | R |

EXHIBIT A-4 WASTE MANIFESTS



FAX COVER SHEET

WASTE MANAGEMENT, INC.

DISPOSAL

CWM Chemical Services, LLC. 1550 Balmer Rd. Model City, NY 14107

MARCH 1999 CC SDK D CEFILE 600-591.

DATE: KATHY MORIN - CUSTOMER SERVICE REP. FROM: DIRECT PHONE - (716) 754-0455 FAX - (716) 754-0211 E-MAIL - KMORIN@WM.COM 609-588-6403 FAX #: RE:

Total number of pages including cover sheet:

| SENT BY | | 1-24 | 1- U ; 15:U4 ;C | WM MODEL CITY-ADMIN→ |
|---------|----------|-----------|-----------------|----------------------|
| WIADT. | PROF THE | | MUNITEDT # | KUCCILI # |
| ATE | NUMBER | (LBS) | | |
| * | | | | |
| 3/02/99 | BG2618 | 45040.00 | NYG1404567 | 081501743 |
| _ | BG2618 | 46640.00 | NYG1404576 | 081501744 |
| | BG2618 | 51540.00 | NYG1404585 | 081501745 |
| - 1 | BG2618 | 49260.00 | NYG1404558 | 081501756 |
| | BG2618 | 48440.00 | NYG1404594 | 081501757 |
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| | BG2618 | 49420.00 | NYG1404495 | 081501761 |
| • | BG2618 | 45020.00 | NYG1404504 | 081501762 |
| | BG2618 | 50340.00 | NYG1404486 | 081501763 |
| | BG2618 | 50840.00 | NYG1404441 | 081501766 |
| | BG2618 | 49060.00 | NYG1404423 | 081501767 |
| | BG2618 | 46340.00 | NYG1404468 | 081501768 |
| | BG2618 | 47360.00 | NYG1404477 | 081501769 |
| | BG2618 | 47060.00 | NYG1404459 | 081501770 |
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| | TOTAL | 725300.00 | | |
| 3/03/99 | BG2618 | 60300.00 | NYG1404396 | 081501795 |
| , | BG2618 | 43440.00 | NYG1404315 | 081501802 |
| | BG2618 | 46120.00 | NYG1404333 | 081501803 |
| | BG2618 | 46540.00 | NYG1404369 | 081501805 |
| | BG2618 | 50120.00 | NYG1404414 | 081501810 |
| | BG2618 | 46560.00 | NYG1404405 | 081501811 |
| | | | ., | |
| | TOTAL | 293080.00 | | |

6095886403;# 2/ 2

TOTAL 293080.

TOTAL 1018380.00

END OF REPORT * * *

INTEROFFICE CORRESPONDENCE

TO:

J. Raspa

Perth Amboy

Steve Weber

FWENC

cc:

CE File 600-597.4.02

FROM:

S. D. Kohlhase

DATE:

3/23/99

SUBJECT: Corrected Hazardous Waste Manifest for Heater PCB Disposal

Attached is a copy from IT/ OHM of the corrected manifest sent to Model City for the disposal of PCB contaminated soils from the polyester heater pad excavations. Due to the level of PCB's additional clarifications are required notifying the facility that the materials are environmentally hazardous. A copy should be put in the RAR addendum.

If there are any questions call George Arbutina at IT, ph. 609-588-6338.

NYG 1404558

DEPARTMENT OF ENVIRONMENTAL CONSERVATION DIVISION OF SOLID & HAZARDOUS MATERIALS



Please type or print. Do not staple .

HAZARDOUS WASTE MANIFEST RO. Box 12820, Albany, New York 12212

| 7 | V | IFORM HAZARDO VASTE MANIFEST | US 1. Generator | 's US EPA ID No. | Manifest | | | | tion within heavy-b | - 1 |
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| Ö | 9. De: | signated Facility Name and | 1 5:4- 4.12 | | | | | | (- : - - - - - - - - - | ittiits 2. o |
| D | 90 | m emmittel Philips | | 10. US EPA ID NU | mber - | 3 | G. State F | acility ID | 4.0 | |
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HAZARDOUS WASTE MANIFEST P.O. Box 12820, Albany, New York 12212

| COMPANSE. | |
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| Hazordeus Waste Manifest 1/28/98 |) |

| | WASTE MANIFEST | 1. Generator's US E | PA ID No. | Manifest D | oc. No. | 2. Page 1 | of Information is not requ | n within heavy: bol ired by Federal La | Waster at Ji. |
|-------------|--|--------------------------|---------------------------------------|---|--------------|------------------|----------------------------|--|-----------------|
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| | 3.Generator's Name and Mailing Add | dress | | اعت الحادث العادة العادة ا | ^ | . N | YG 140 | 4315 | ार्थकः । इत्यान |
| | 4. Generator's lelephone Number (| | 65-6600 | | В | . Generato | or's ID | - colored - colored - colored | |
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| L | * | | V 1 1 V | 13. 3 | 11. | | ter's Telephone | त के स्वीतक्षाक्षणका र | CHECKTON, |
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| | J. Additional Descriptions for Materia | de Cata d'Alexand | | NAME OF TAXABLE PARTY. | سنسلسا | V Has | dling Codes for | Wastes Listed Abo | |
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| 1 | 15. Special Handling Instructions an | d Additional Information | | | | | | . y a an⊊derres | a Ъ." |
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| 1 | Empryancy Conti | net: Tan Jayaar | IT Corp. BOOM | M2-2953 | | | ** | strinasna radin | U LA RIEN |
| | 16. GENERATOR'S CERTIFICATION | : I hereby declare that | the contents of this c | onsignment | are fully ar | nd accurate | ly described abo | ve by proper ship | ping name |
| | and are classified, packed, marked a | | | | | | | | |
| | national government regulations and If I am a large quantity generator, I c | state laws and regula | ations. | uce the volum | ne and tox | cicity of was | ste generated to | the degree I have | determined |
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| | present and future threat to human i | nealth and the environ | ment; OR if I am a sr | mall quantity | generator, | , I have ma | de a good faith | effort to minimize | my waste |
| | generation and select the best waste Printed/Typed Name | management method | Signature . | and that I | S. J. J. | | > | Mote D. Doubay | |
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| \dashv | 17. Transporter 1 Acknowledgement | of Pacaint of Matain | | | | | | | |
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| | 19. Discrepancy Indication Space | | | | | | | AND AND THE STATE OF | |
| _ | | | | | | | | e signature (Ex = ; | |
| | 20. Facility Owner or Operator: Cer | tification of receipt of | hazardous materials | covered by th | is manifes | t except as | noted in Item 1 | | |
| FACILITY | Printed/Typed Name | incultor of receipt of | Signature | | | | | Mo Day | -Year |
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HAZARDOUS WASTE MANIFEST P.O. Box 12820, Albany, New York 12212

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| | | MYH)) mya) | Ket 21 A | | | ansporter's ID | | 149 1595 BHOG - 105 E MINI |
| 100 | 7 Transporter 2 (Company Name) | 8. US EPA ID Number | 1 1 1 1 | | Section 1180 CHROSEN AND AND | rter's Telephone (| | and a to a total |
| 5 | Designated Facility Name and Site Address | 10. US EPA ID Number | | | G. State F | | | |
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| | Redel City, 65 14187 | | | 7 | H. Facility | Telephone (|)****** | THE TOTAL |
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| | J. Additional Descriptions for Materials listed Above | 1 | | | K. He | andling Codes for | | sted Above |
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| | 70 | 8104 | | | | 803 B | P- 5 | gua pag |
| Kesponse | Emergency Contact: Tom Joyner 17 | cosh enemerse | 123 | | | | e.ctxt | grament Americans |
| | 16. GENERATOR'S CERTIFICATION: I hereby declare t and are classified, packed, marked and labeled, and ar | hat the contents of this co | onsignment o | re fully | and accura | tely described abo | ve by pro | per shipping name |
| | national government regulations and state laws and reg | julations. | | | | | 2445 | ner come = d D ment |
| 5 | If I am a large quantity generator, I certify that I have a to be economically practicable and that I have selected | program in place to redu | ce the volun | ne and to | oxicity of w | aste generated to | the degre | e I have determined |
| e | present and future threat to human health and the envi | ronment; OR if I am a sm | all quantity | generato | or, I have m | ade a good faith | effort to n | minimize my waste |
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| r spill immed TRANSPORTER | 18. Transporter 2 Acknowledgement of Receipt of Mate Printed/Typed Name | Signature | | | | * | Mo. | Day Year |
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| | 19. Discrepancy Indication Space | | | | | | | KINISM COLUMBY - J |
| of emergency or spill immediately call the National FACILITY TRANSPORTER | | | | | | | . 3/1 | ttein 20-170 Sinnati |
| FACILITY | 20. Facility Owner or Operator: Certification of receipt | of hazardous materials o | overed by th | is manife | est except o | s noted in Item 19 | 9 | ್ಷವಿದಿ≎ಗು ಕತ್ತ-5400#15 |
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HAZARDOUS WASTE MANIFEST RO. Box 12820, Albany, New York 12212

| (Officerol) |
|------------------------------------|
| (Hazardeus Waste Manifest 1/28/98) |

| | UNIFORM HAZARDOUS 1. Generator's UNIFORM HAZARDOUS WASTE MANIFEST | | ifest Doc. No. | 2. Page 1 of | Informatio is not requ | n within heavychold line at: pired by Federal Lawres a h |
|------------------------|--|-----------------------------------|-----------------|------------------|---------------------------|--|
| 1 | 3.Generator's Name and Mailing Address | 2 16 5 6 1 0 | N 3117 | A | | |
| | | wery that | -, | ~ N | G140 | 14405 WILL STREET |
| GENERATOR | Perth As | boy, BJ CEGRI | | B. Generator | s ID | New 3-Energies 118 Etc. |
| | 4. Generator's Telephone Number () 5. Transporter 1 (Company Name) | 6. US EPA ID Number | | C. State Trans | sporter's ID | CARETA TOTAL SE |
| | PAGE ETC. INC | WIYLATEBISIS | 7940 | 100 | | 2015 HEAV |
| | 7 Transporter 2 (Company Name) | 8. US EPA ID Number | 5 17 7 | E. State Trans | | Carlo Recipions and |
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| | Designated Facility Name and Site Address Change Services | 10. US EPA ID Number | | G. State Facil | ity ID | AGE of the Bened |
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| | Hodel City HT. 14187 | # # B 4 8 3 | | | | י באפבור לכי שניים הרציאוסד |
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... of emergency or spill immediately call the National Response Center (800)

HAZARDOUS WASTE MANIFEST P.O. Box 12820, Albany, New York 12212

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.. of emergency or spill immediately call the National Response Center (800) 8802 and the NYS Department of Environmental Conservation (518) 457-73.

HAZARDOUS WASTE MANIFEST P.O. Box 12820, Albany, New York 12212

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HAZARDOUS WASTE MANIFEST P.O. Box 12820, Albany, New York 12212



(Hazardous Waste Monifest 1/28/98)

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HAZARDOUS WASTE MANIFEST. P.O. Box 12820, Albany, New York 12212

(Theoreton William Montage 1/28/96)

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UNIFORM HAZARDOUS 1. Generator's US EPA ID No. Manifest Doc No. 2: Rage of Information within bedry bold line is not required by Federal Law. WASTE MANIFEST 64 5 0 6 2 1 6 S 6 3 3. Generator's Name and Mailing Address NYG1404495 1000 Convery Blvd 457-B. Generator's ID Perch Ambey, 6J 68861 Conservation (518) C. State Transporter's ID 5. Transporter 1 (Company Name) 6. US EPA ID Number रता । ने राष्ट्रपट्रमहोता गर्ना रो E. State Transporter's ID 2000 Section 1000 8. US EPA ID Number E Transporter's Telephone (10. US EPA ID Number 9.5 Designated Facility Name and Site Address G. State Facility 10 CHA Chemical Services Environmental - withing (II Hall Martin 1550 talper M H. Facility Telephone (THE) Facial City, SY 14197 6 7.8 E Y & B 4 9 8 2 6 11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number) -13. Total-" 12. Containers ō a. Department Veste fol vehleriseted Eisbenelers . BEZZIE .PGI] STATE and the STATE 8802 J. Additional Descriptions for Materials listed Above-X. Handling Codes 72 Selle/Compet 15. Special Handling Instructions and Additional Information Protile scans Satroney Contact: Ton Jopen II Corp. 801-642-1512 16. GENERATOR'S CERTIFICATION. I hereby declare that the contents of this tons grament are fully and accurately described above by people stripe transforment and are classified, packed, marked and labeled, and are in all respects in pupper condition for transport by highway according to applicable international and national government regulations and state laws and regulations. If Lam storge quantity generatory sertify that I have a program in place to reduce the volume and toxicity of waste generated to the depend form electronic and toxicity of waste generated to the depend form electronic and that I have selected the productible method of its different, storage, or disposal currently available as me worth eliminates the to be economically practicable and that I have selected the practicable method of Assiment, storage, or disposal currently available to me present and buture threat to human health and the environment; OR if I am a small quantity generator, I have made a good furth effort to adjust the first and that I can offord. Printed/Typed Name 47: Transporter 1. Acknowledgement of Receipt of Materials And The Control 15 Printed/Typed Name d/lyped Name 1 Table 1 To 18. Transporter 2 Acknowledgement of Receipt of Materials Year Printed/Typed Name Signature POL 19. Discrepancy Indication Space The second second 20. Facility Owner or Operator. Certification of receipt of hazardous materials covered by this manifest except as noted in Hem 19, ō Signature Printed Typed Name THE HALL THE 3

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UNIFORM HAZARDOUS 2. Page 1 of Information within heavy bold line Manifest Doc. No. 1. Generator's US EPA ID No. is not required by Federal Law. -WASTE MANIFEST .r.derrie 3.Generator's Name and Mailing Address NYG1404594 17-90 1008 Convery White and the NYS Department of Environmental Conservation (518) 457. B. Generator's ID Porth Autor, al asset 4. Generator's Telephone Number (\$56) 266-6659 C. State Transporter's ID 6. US EPA ID Number 5. Transporter 1 (Company Name) D. Transporter's Telephone nac WY1091816 C 5 TC E. State Transporter's ID 8. US EPA ID Number Transporter 2 (Company Name) F. Transporter's Telephone (1 1 1 1 1 G. State Facility ID 9. Designated Facility Name and Site Address 10. US EPA ID Number CIN Charical Services SOT IN CHARGE SE 1958 Salant Ed H. Facility Telephone (716) 756-4532 Model City, BY 14167 87 B & 4 S & 5 6 6 7 4 11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number) 12. Containers 13. Total 4. Unit Quantity Wt/Vol I. Waste No. Number EPA .-- . JETTUNE to the a. Moste Palychlorineted Siphonolists, SECILS, PEIL STATE EPA GENERATOR DI HSTA STATE EPA -·:-999 -- 9 - -- -STATE EPA d. STATE -8802 K. Handling Codes for Wastes Listed Above J. Additional Descriptions for Materials listed Above and "Factor Lace PCB Seils/Concrete Response Center (800) ಎ (ನಿರ್ದಿ) ಕಿನ 15. Special Handling Instructions and Additional Information Modile Baldis Emergancy Contact: Ion Joyner IT Corp 60 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and immediately call the National national government regulations and state laws and regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford. Day -Year Printed/Typed Name 17. Transporter 1 Acknowledgement of Receipt of Materials Day Year **TRANSPORTER** Printed/Typed Name Signature DEAR Spill 18. Transporter 2 Acknowledgement of Receipt of Materials Day Year Mo. Printed/Typed Name Signature 9 emergency Series Ils 19. Discrepancy Indication Space ment 25-106 stonature it 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19. ... ō Printed/Typed Name Signature

In case of emergency or spill immediately call the National Response Center (800) 8802 and the NYS Department of Environmental Conservation (518) 457-7-

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STATE OF NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION DIVISION OF SOLID & HAZARDOUS MATERIALS.



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gency or spill immediately call the National Response Center (800) 424-88u. and the NYS Department of Environmental Conservation (518) 457-7362

TRANSPORTER

HAZARDOUS WASTE MANIFEST P.O. Box 12820, Albany, New York 12212

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STATE OF NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION DIVISION OF SOLID & HAZARDOUS MATERIALS



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HAZARDOUS WASTE MANIFEST P.O. Box 12820, Albany, New York 12212

UNIFORM HAZARDOUS 1. Generator's US EPA ID No. -Manifest Doc. No. 2. Page 1.of Information within heavy bold line no WASTE MANIFEST is not required by Federal Law. 3.Generator's Name and Mailing Address Corp NYG 14045 1000 Cappery Milud B. Generator's ID 4. Generator's Telephone Number (\$68) Transporter 1 (Company Name) C. State Transporter's ID D. Transporter's Telephone Transporter 2 (Company Name) E. State Transporter's ID if countries had the F. 'Transporter's Telephone (9. Designated Facility Name and Site Address 10. US EPA ID Number-G. State Facility ID CER Charical Services reside è end 10-1 de design en 1560 Beloor M wi: 1. L27 1.4 . David H. Facility Telephone (Rodal City, MT 14107 11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number) DESTROOM 13 Total 4. Unit Number | Type Quantity Wt/Vol I. Waste No. EPA GENERATOR 7712510 STATE Serial Company of the company 1.1150 1.7 EPA ⊒M ∴ Rieetric 11 . . 51. 127 20 STATE EPA J. Additional Descriptions for Materials listed Above K. Handling Codes for Wastes Listed Above PCS Solls/Concrete 15. Special Handling Instructions and Additional Information may Contact: Ton Jayane IT Carp 600-4 16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and state laws and regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I condition. Printed/Typed Name - Day Year 17. Transporter 1 Acknowledgement of Receipt of Materials Printed/Typed Name Signatur Day 18. Transporter 2 Acknowledgement of Receipt of Materials Printed/Typed Name Signature Day Year 19. Discrepancy Indication Space 20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19. Printed/Typed Name Signature FILEON CARTON

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STATE OF NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION DIVISION OF SOLID & HAZARDOUS MATERIALS

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DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SOLID & HAZARDOUS MATERIALS



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| 1 | 3.Generator's Name and Mailing Address | Nitce Cer | rge. | ***** | ^ | | NYG 140 | 7 / / | 100 |
| | | 1800 Com | pary Blud | | | | | 144 | Ð J |
| | | | My. Al 00361 | | В | Genero | ator's ID | · | tem : |
| 4 | Generator's Telephone Number (| | . US EPA ID Number | | | <u> </u> | arit. | 1 | 71 |
| | 3. Italia (Company Name) | را | S. US EFA ID NUMBER | 1809 | | 3 | ransporter's ID | -55 | FOO FILE |
| | 7 Transporter 2 (Company Name) | - 7 | B. US EPA ID Number | 1 1 4 7 | _ | | ransporter's ID | 1000 | Rem J n - See EA |
| | en " - = | ١ | . OS EIZIO NOMBEI | 1 | _ | | orter's Telephone (| | Hems S. C. 200 6 |
| | 9. Designated Facility Name and Site Ad | dress 1 | 0. US EPA ID Number | | | | acility ID | | 32 - Mary 1 - May 1 |
| | CHR Chauteak Services | | U. US EFA ID NUMBER | | | 5 | The contract of | | MATERIAL STATE |
| | 1560 Balmer Ad | | | | 9 H | . Facility | Telephone (716 | | |
| | Model City, M. 14187 | | | | -4 | | | | check for authorizate |
| 1 | 11. US DOT Description (Including Prope | Shipping Name | e, Hazard Class and I | Number) | 12. Con | tainers | 13. Total | 14: Unit | TREM 1 (TE |
| | | | | 1/2 | Number | Туре | Quantity | Wt/Vol | I. Waste No. |
| | a. /212 | MIX | (TUZE DE | -1 | | *7 | CST | יוניייי סו | EPA 1 . Te 1 Simulii |
| | ligate Polychloriunted Si | by Sistement | W2315,PE11 | | 0 0 1 | 8 T | 1 0 0 00 | K | STATE PORT |
| | b. | | | | | HH | 80-00 | | 504 |
| | The state of the s | er Colonia er en er En en | 141. | | | av. | 1 | DEC JES DISSOC: | STATE |
| 2 | | | | | | | | | Short STOT |
| 5 | c | | * | | -5. | 2. | | אויה זונטכ | ₽A ~ JUIT |
| | * 50 | r ×1 | | | | | | | STATE |
| | d. | | | | | | | | EPA |
| | | | | | | | | | STATE |
| | J. Additional Descriptions for Materials lis | | | | | | <u> </u> | | 71 mad |
| | | Ted Above | 1 | | 1500 | K. H | andling Codes for | | isted Above |
| 1 | a PCS Set1s/Cencrete | 1 + 1 | с | | | a | | С | لــنـا قصيدم. |
| 1 | | | | | · | | П | *51. | og 606,1, 1161 * |
| 1 | Ь | <u> </u> | d | | | b | | d | that the |
| | 15. Special Handling Instructions and Ad | ditional Informa | tion - | - 4417 | | ar jiri, i | 81 | 777 | 770 |
| | frefile 802616 | 1# U | 18092-15 | • | 4 | 1.1 | Fin 11 | 100 | Porting to the state of the sta |
| - | <u> </u> | | | n et fa | an a Pop | 4 | 24/10 | and min | went Account of the |
| | 16. GENERATOR'S CERTIFICATION: I he | woor IT C | rp. 800-863-23 | 3 | -,, | 1 | 0700 | 421 | 21.49 |
| | and are classified, packed, marked and la | | | | | | | | |
| | national government regulations and state | e laws and regu | lations. | | | | To Charles | Taken Taken | ECDIE I - 1 IS G SA |
| | If I am a large quantity generator, I certify to be economically practicable and that I | | | | | | | | |
| | present and future threat to human health | n and the enviro | nment; OR if I am a si | mall quantity | generator, | l have m | ade a good faith e | effort to r | minimize my waste |
| 1 | generation and select the best waste man Printed/Typed Name | agement metho | Signature | ne and that I | can afford | 1 | ÷. | | with Ain-Bivd xod cor coeDayspu Year |
| 1 | · · · · · · · · · · · · · · · · · · · | Part | 11 | ()) | Vate. | 1. | . 1: | 171 | 19111718 |
| 1 | 17. Transporter 1 Acknowledgement of R | | als | | | | 1. | | |
| 1 | Printed/Typed Name | and the second s | Signature | | 3 | | | Mo. | Day Year |
| | Transit for | and | 1 | | in the | | 1, | 013 | 011919 |
| | 18. Transporter 2 Acknowledgement of R | eceipt of Materio | als | - | ~. · | - / | L | last en | and a first and |
| | Printed/Typed Name | | Signature | | | | • | Mo | Day Year |
| | | | | | | | | | 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |
| | 19. Discrepancy Indication Space | | | | . 1.1.5 | | | | いらんし しょうかい |
| . | at to do so | 1 - 7 | 12461 | 1 22 7 | i inf | | · | | Item 20-The signatu |
| | 20. Facility Owner or Operator: Certificat | tion of receipt of | hazardous materials | covered by thi | s manifest | excent a | s noted in Item 10 | | SELECTOR ST. (FACTOR) |
| | Printed/Typed Name | or receipt of | Signature | COTOLOG DY INI | - maimest | aveahi a | 2 | | Em Day wcu.Year |
| | | | | | | 15-20 | * a = 2 | | กลักระดบอเปี ราก (เ |
| 1 | EKLOW CAKT | 727 | 1 47/1 | | M: | 1 | 1/ | 113 | 0299 |

EXHIBIT A-5 CONCRETE WASTE CHARACTERIZATION DATA

|] | | | PCB DATA ANA | | | | SAMPLE NO. |
|---|-------------------------|------------------------------|------------------|------------------|---------|-----------------|------------|
| L | Lab Name: 21ST CEN | ITHOU CAN VIDOANACAT | 1B | Contract: | | | 029901 |
| 1 | | ITURY ENVIRONMENT | | | | l | 0 |
| 1 | Project No.: | | ite: | Location: | | | Group: |
| 4 | atrix: (soil/water) | Soil | | | L | ab Sample ID: | |
| J | Sample wt/vol: | 10(g/mL) | g | | | Lab File ID: | D4718.D |
| | Level: (low/med) | LOW | | | | Date Received: | 2/4/99 |
| 1 | % Moisture: | _ | decanted: (Y/N): | N | D | ate Extracted: | 2/4/99 |
| L | Concentrated Extract Vo | lume: 10 | (ml) | | | ate Analyzed: | 2/5/99 |
| ٦ | Injection Volume: | 2.0(uL) | | | D | ilution Factor: | 1000 |
| 1 | GPC Cleanup: (Y/N) | N | pH: | | | | |
| 7 | CAS No. | Compound | | MDL | Result | ug/Kg_ | Q |
| L | | AROCLOR 1016 | | 250000 | | | U |
| | | AROCLOR 1221 AROCLOR 1232 | | 250000 250000 | | | U |
| 7 | | AROCLOR 1232 AROCLOR 1242 | | 250000 | | | Ü |
| J | | AROCLOR 1248 | | 250000 | 1400000 |) | |
| 4 | | AROCLOR 1254 AROCLOR 1260 | | 250000 250000 | | | U |
| | | | | | | | |
|] | | | | | | | |
|] | | | | | | | |
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|] | | | | | | | |
|] | | | | | | | |
|] | | | | | | | |
| 7 | | | | | | | |

EXHIBIT A-6 SOIL WASTE CHARACTERIZATION DATA

| | 000 | DATA ANALYSIS SHEET | | SAMPLE NO. |
|--|------------------------------|------------------------|--|------------|
| ٠, | PC | 18 | | 029903 |
| Lab Name: 21ST CENT | Sitat | Contract: Location: | | Group: |
| Project No.: Matrix: (soli/water) Sample wt/vol: | Sail(g/mL) | 9 | Lab Sample ID: Lab File ID: Date Received: | D4768.D |
| Lavel: (flow/med) % Moisture: Concentrated Extract Vo. | _ | cented: (Y/N): N | Date Extracted: Date Analyzed: | 2/10/99 |
| Injection Volume: | 2.0 (uL) | | Dilution Factor: | 500 |
| GPC Cleanup: (Y/N) | N | pH: | , | • |
| CAS No. | Compaund | MDL | Result ug/Kg | 1 0 |
| | AROCLOR 1016 AROCLOR 1221 | 125000 | | <u> </u> |
| | AROCLOR 1232 AROCLOR 1242 | 125000 125000 | 450000 | u |
| | AROCLOR 1248 AROCLOR 1254 | 125000 | 650000 | Ü |
| ٠, | AROCLOR 1260 | 125000 | | |

J = Detected below method detection limit

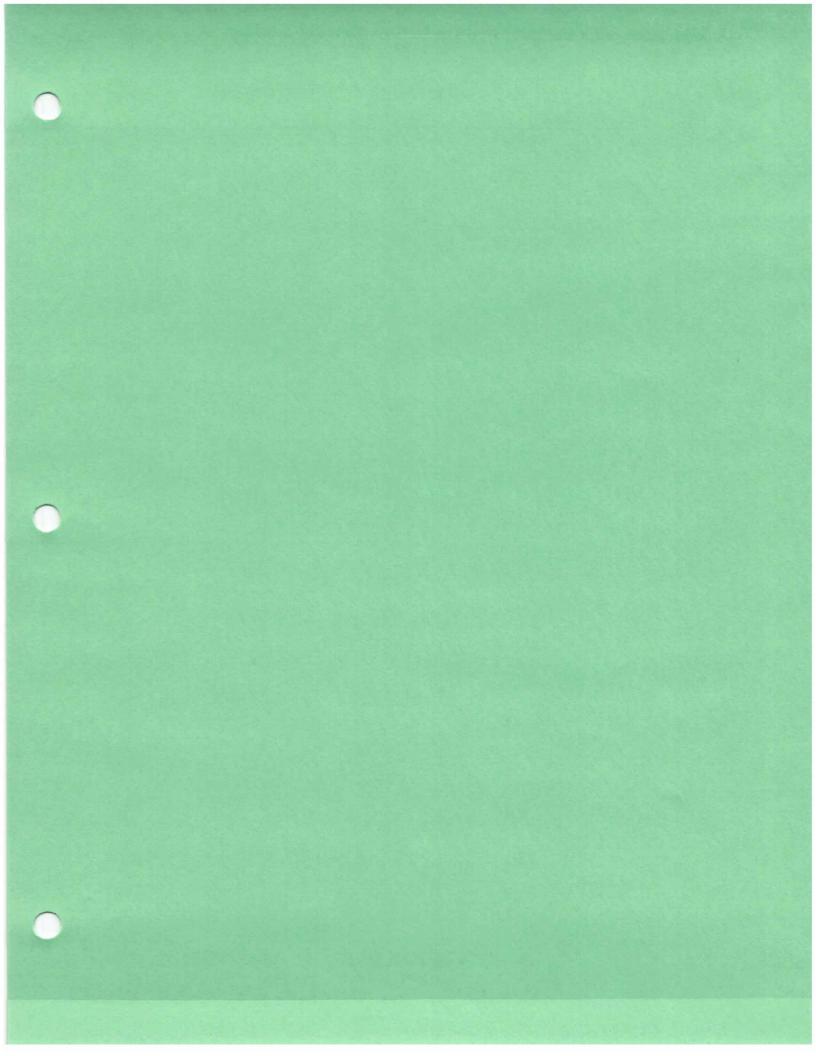
U=Not Detected

82/FEB. 26. 1999: 4_3: 08PM94670HM_ KELLEDIHITON STOS ANDIDENTHE LEGIT DE

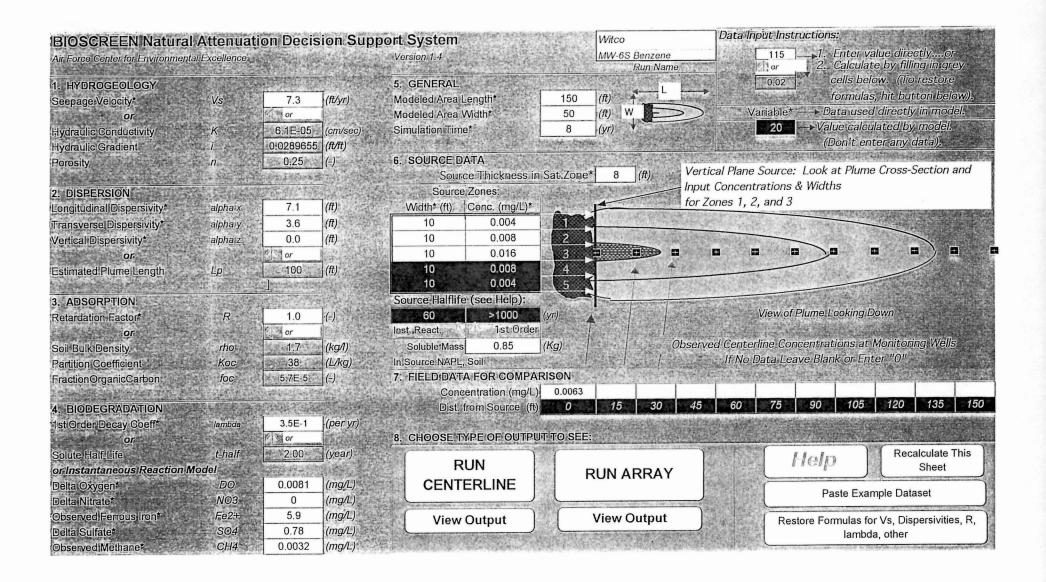
| | | PCB DATA ANALYSIS SHE | T | SAMPLE NO. |
|--------------------------|-------------------|-----------------------|----------------|--------------|
| | • | 18 | | 029804 |
| Lab Name: 21ST CENT | TURY ENVIRONMENTA | Contrac | t: | |
| Project No.: | e. | te: Location | n: | Group: |
| | - | | Lab Sample ID | : G0504 |
| Matrix: (soil/water) | 10 (g/mL) | g | Lab File ID | : D4769.D |
| Sample wt/vol: | LOW | • | Dato Received | : 2/10/99 |
| Level: (low/mad) | | 1 N | Date Extracted | : 2/10/99 |
| % Moletura: | | decanted: (Y/N): N | | |
| Concentrated Extract Vol | uma: 10 | (ml) | Date Analyzed | |
| Injection Volume: | 2.0 (uL) | | Dilution Facto | :500 |
| GPC Clesnup: (Y/N) | <u>N</u> | pH1 | _ | |
| CAS No. | Compound | MDL | Result up/Kg | Q. |
| | AROCLOR 1016 | 125000 | | U |
| | AROCLOR 1221 | 125000 | | U |
| | AROCLOR 1232 | 125000 | | Ü |
| | AROCLOR 1242 | 125000 | | |
| | AROCLOR 1248 | 125000 | | U |
| | AROCLOR 1254 | 125000 | | |
| | AROCLOR 1260 | 126000 | | |

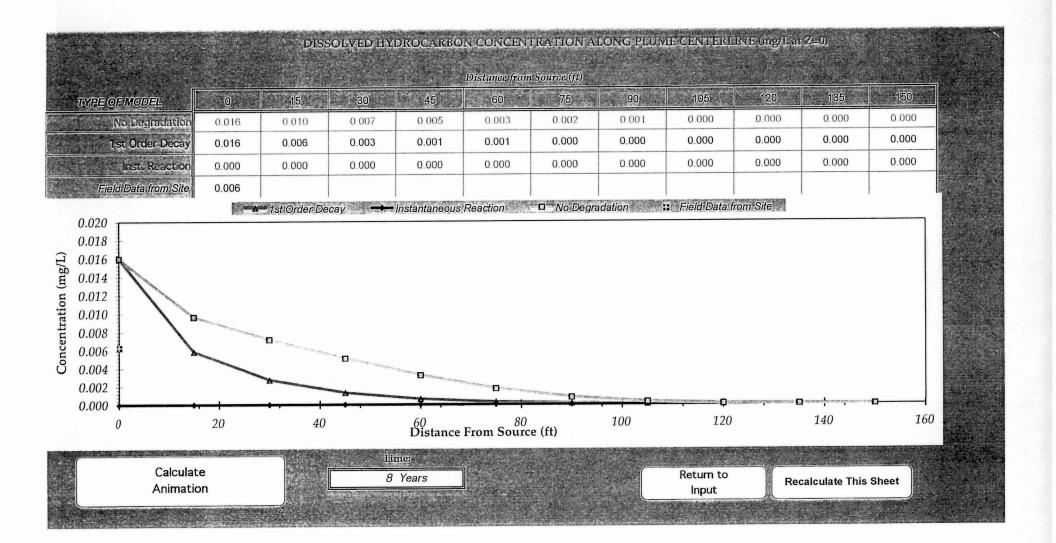
J = Detected below method detection limit

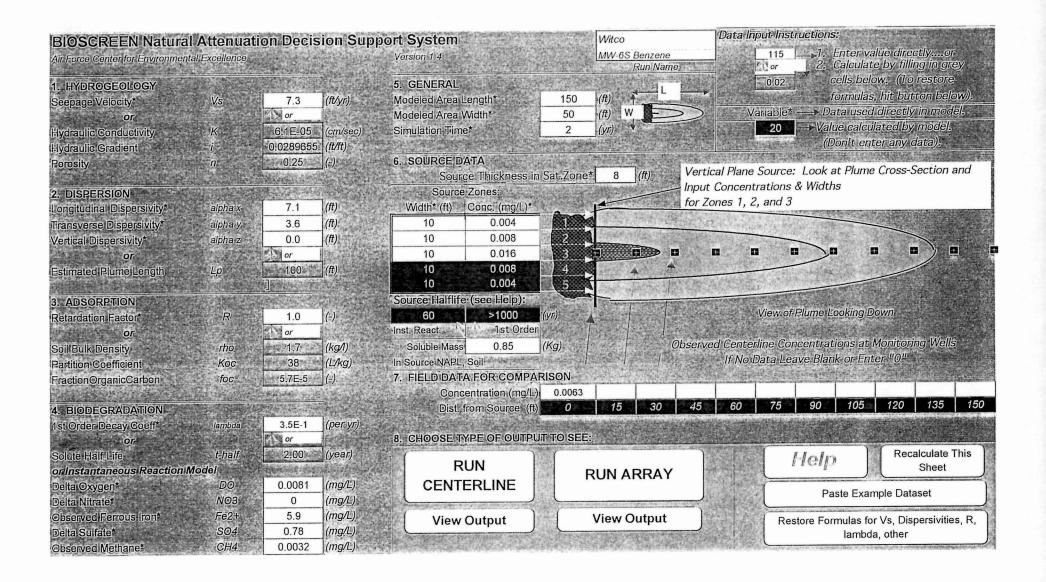
U = Nat Deteated

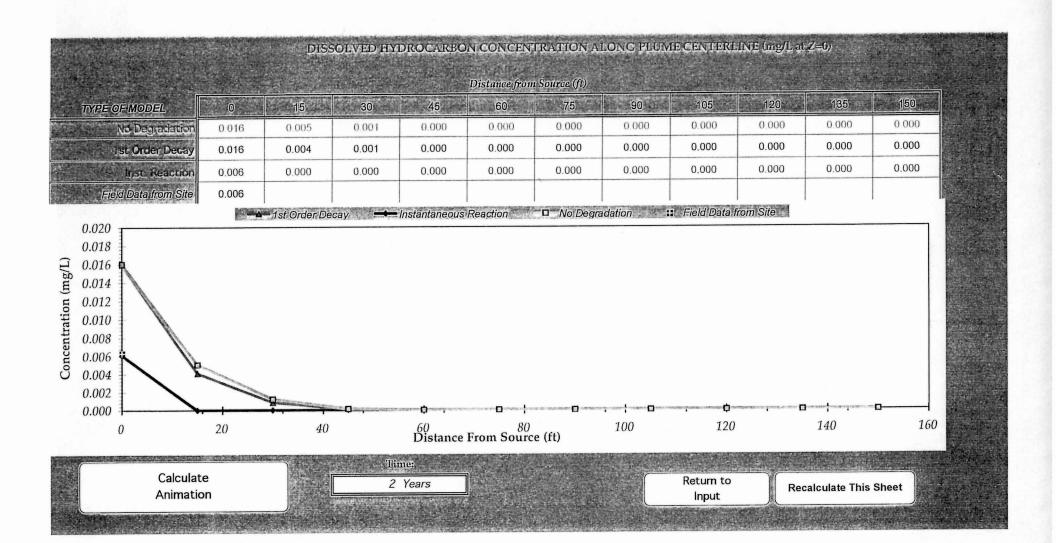


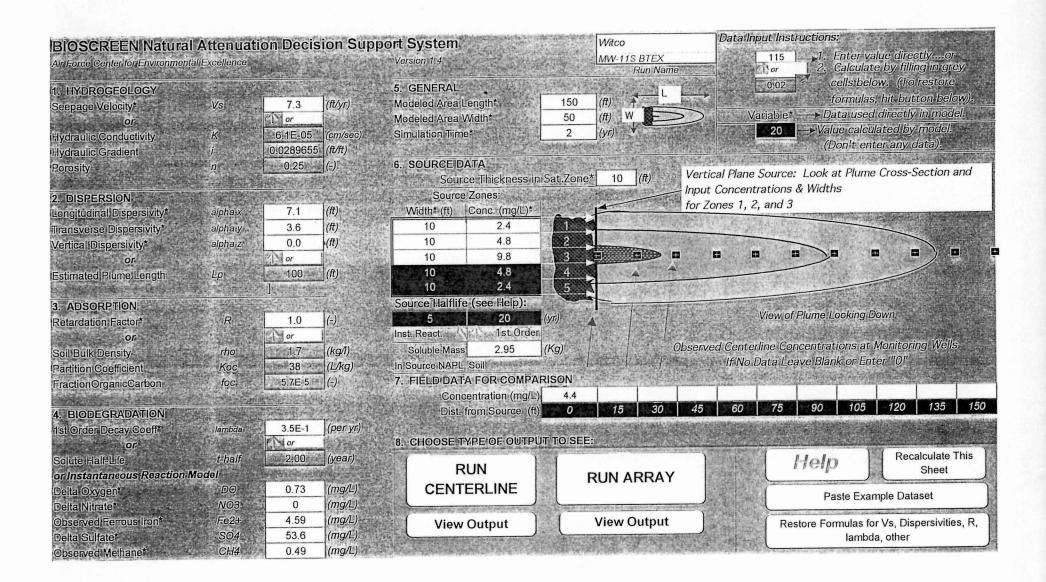
APPENDIX B GROUND WATER MODELING SUPPORTING DATA

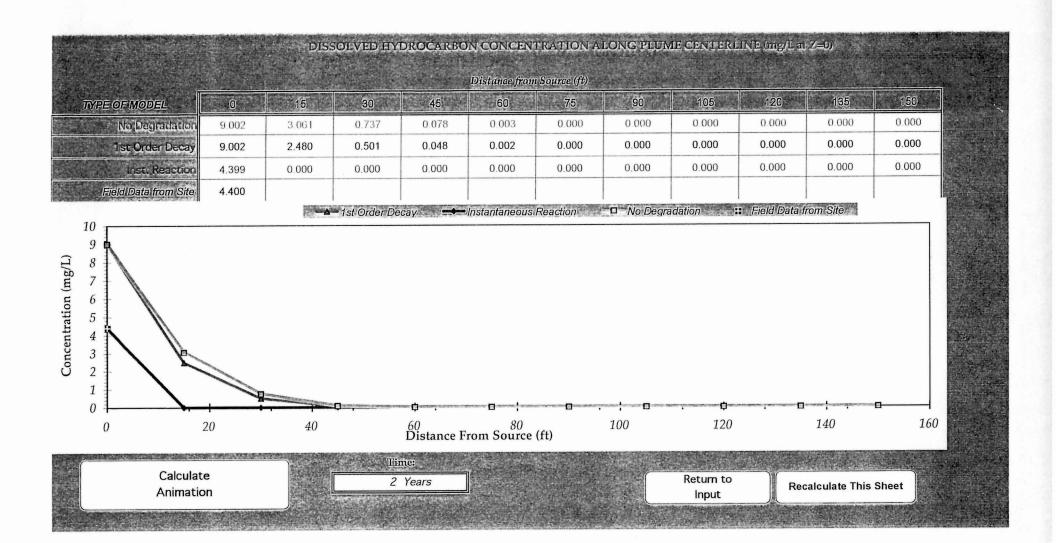


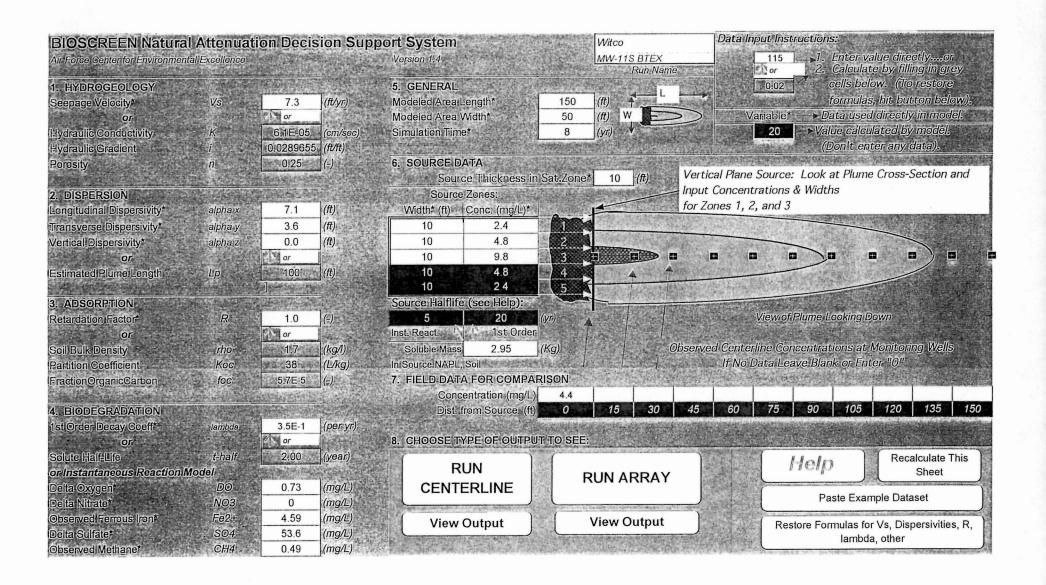


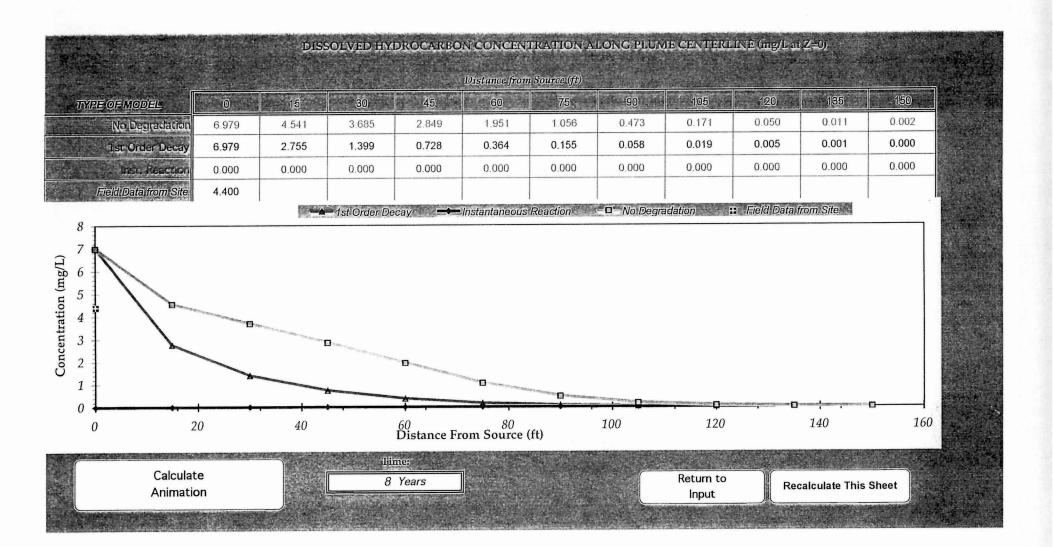


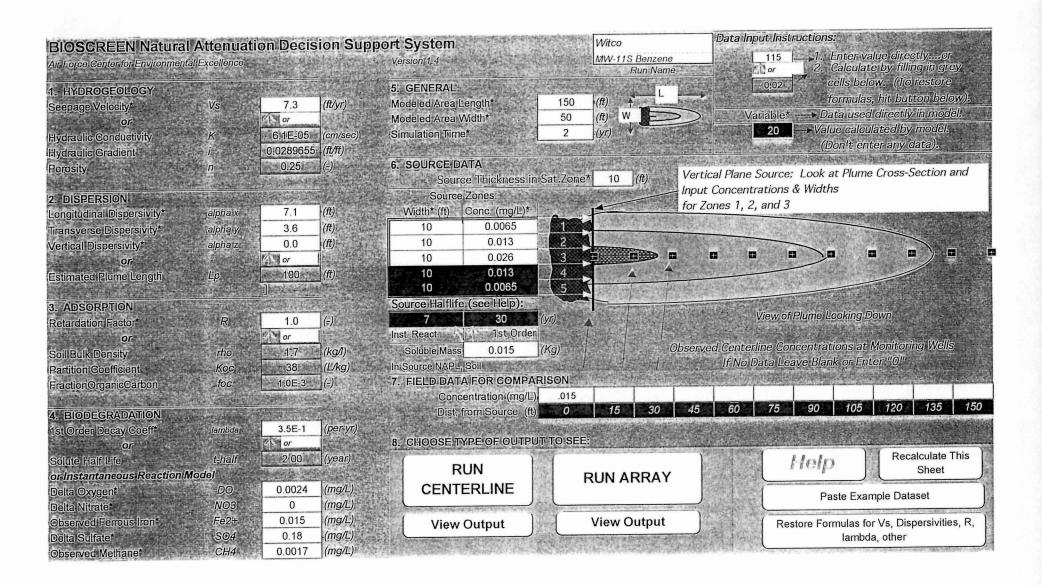


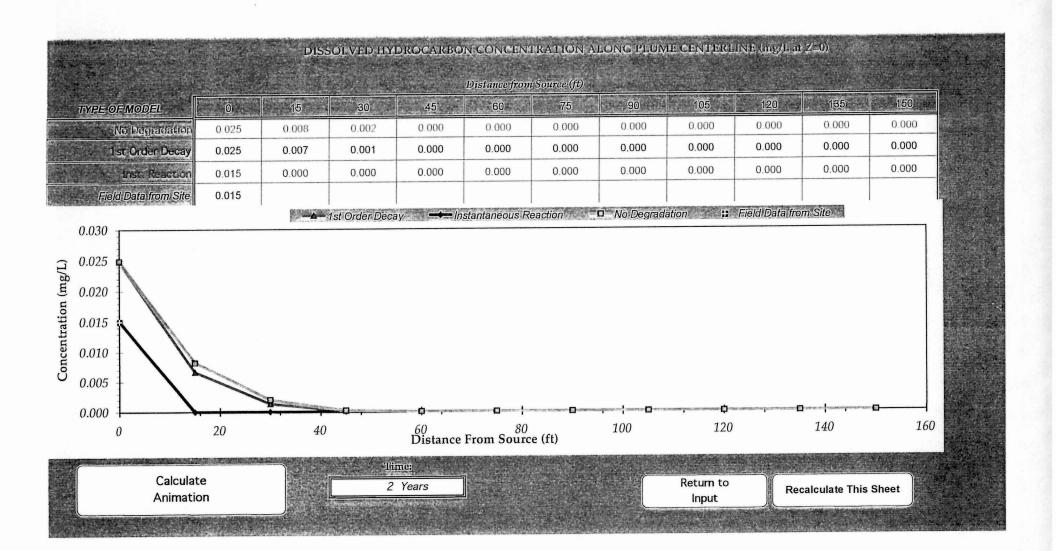


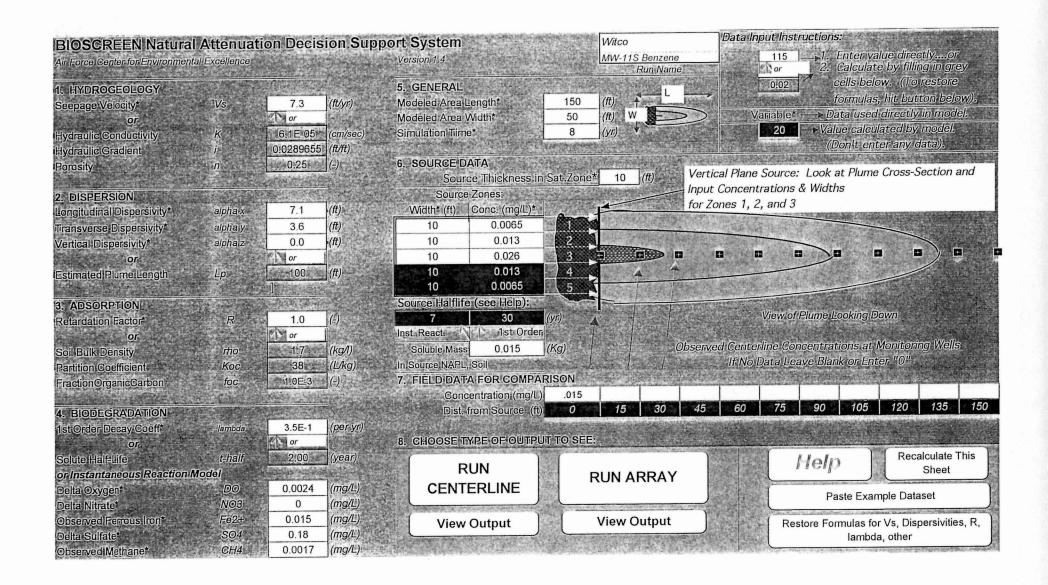












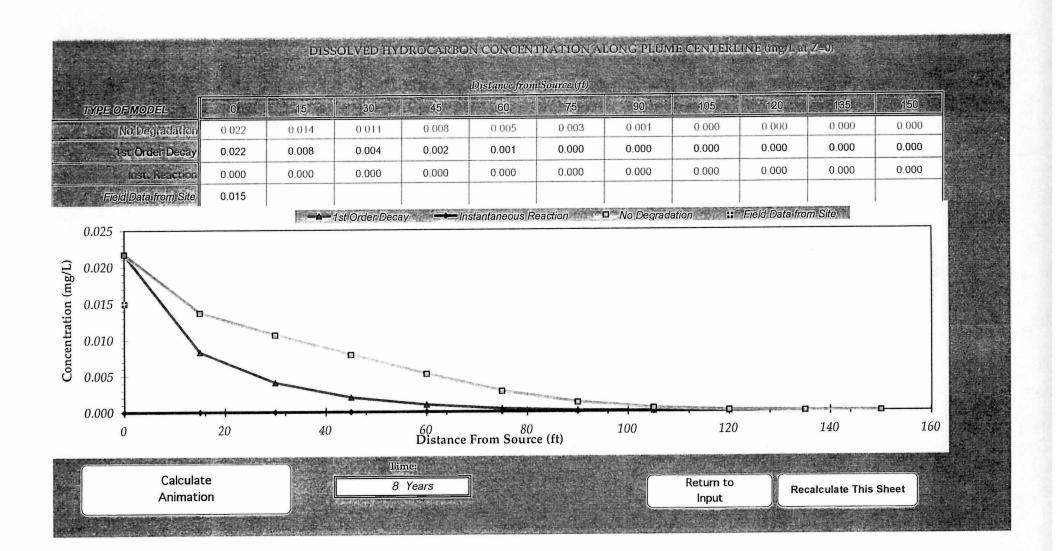


FIGURE 5-3
WITCO CORPORATION
TCE and Total VOCs Plots Trend Plots
MW-1S

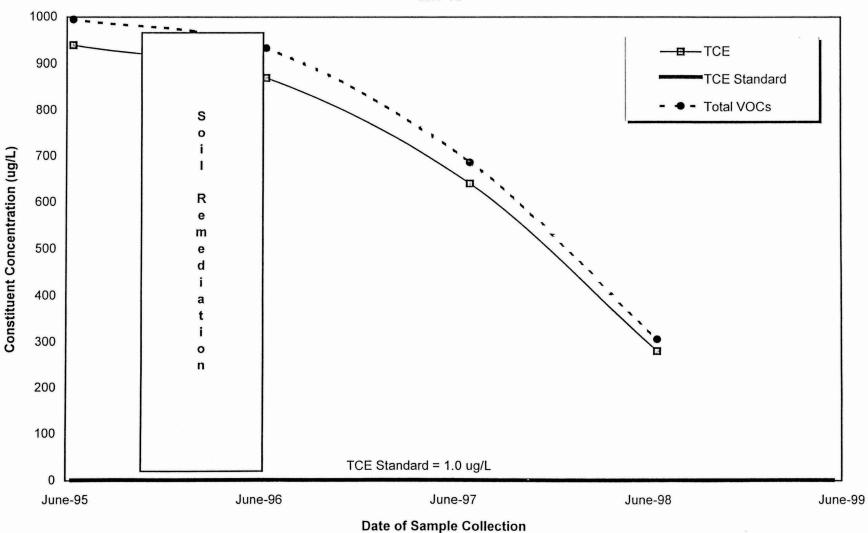


FIGURE 5-4
WITCO CORPORATION
1,1-DCE and cis-1,2-DCE Trend Plots
MW-1S

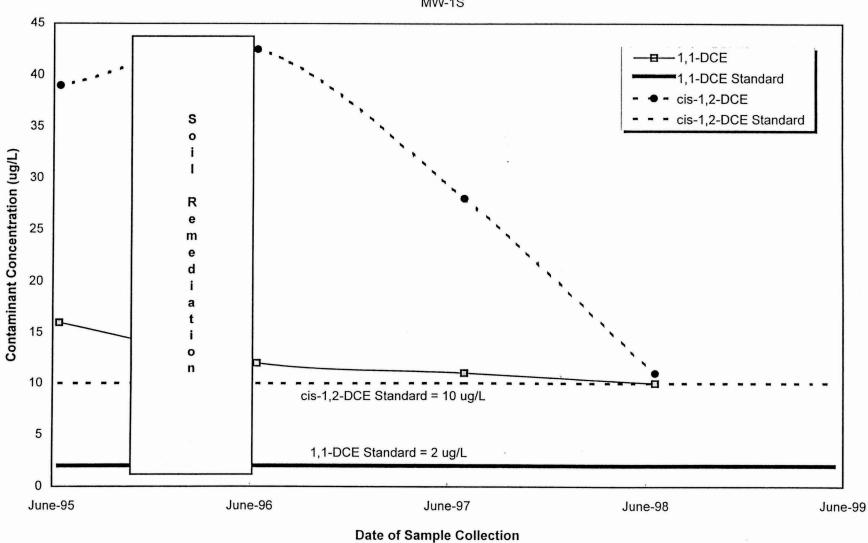


FIGURE 5-5 WITCO CORPORATION Chloromethane Trend Plot MW-6S

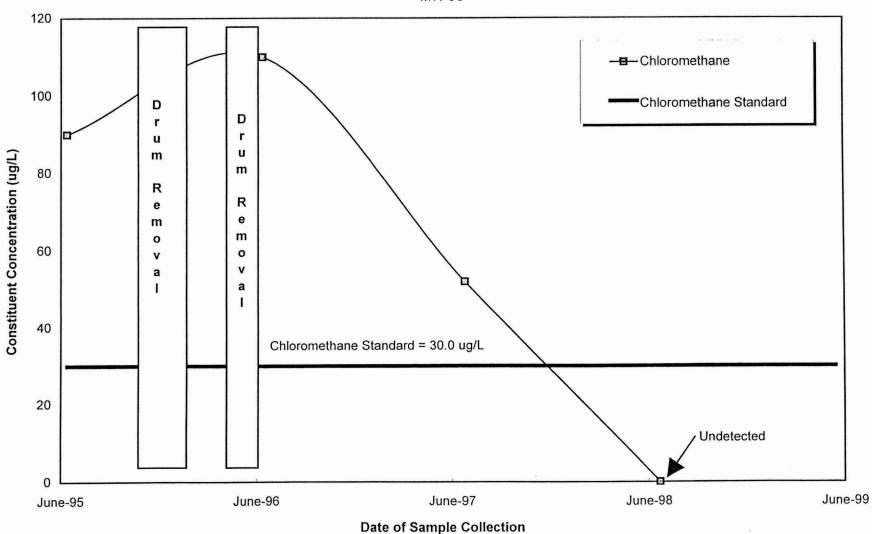


FIGURE 5-6 WITCO CORPORATION Benzene Trend Plot MW-6S

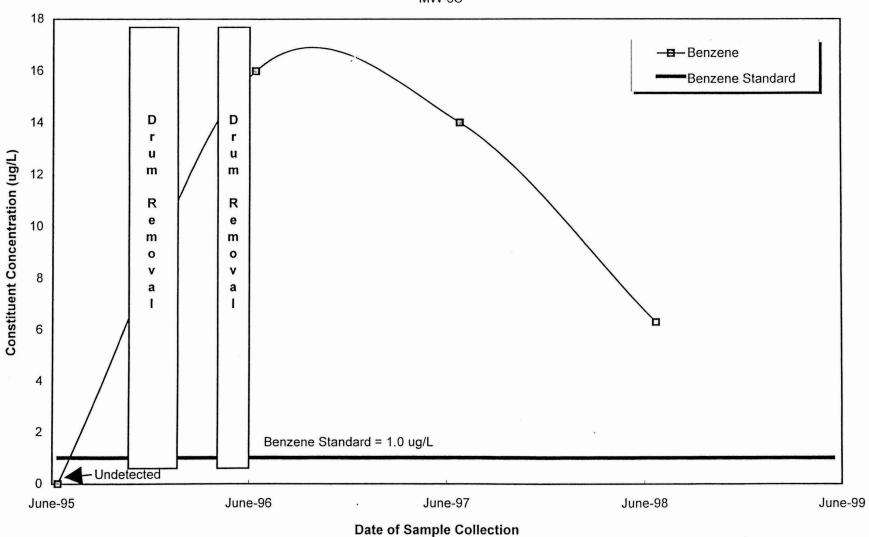


FIGURE 5-7 WITCO CORPORATION Total VOCs Trend Plot MW-6S

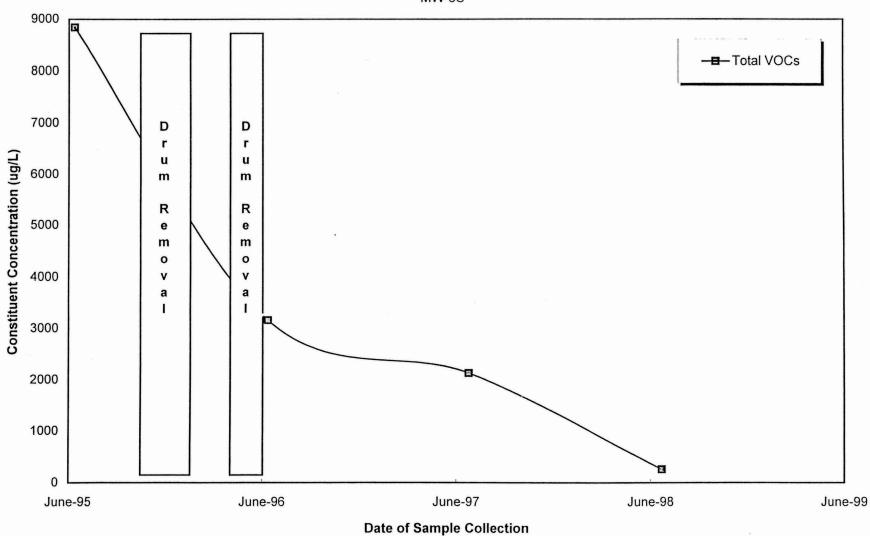
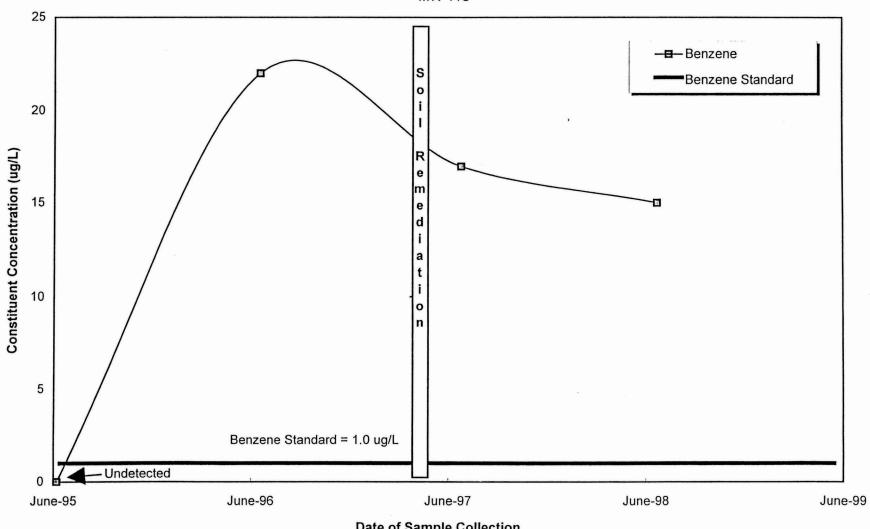
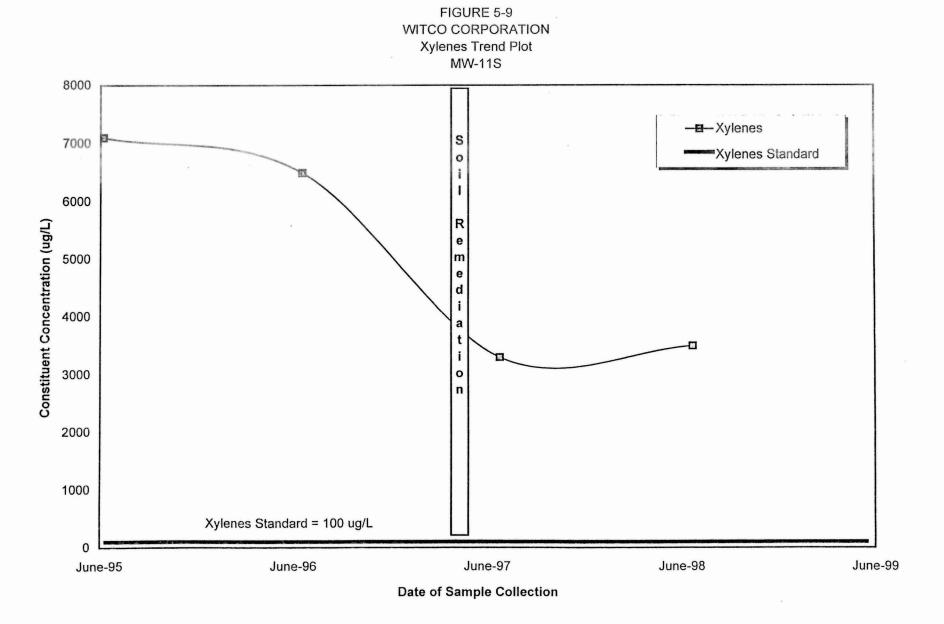


FIGURE 5-8 WITCO CORPORATION Benzene Trend Plot MW-11S





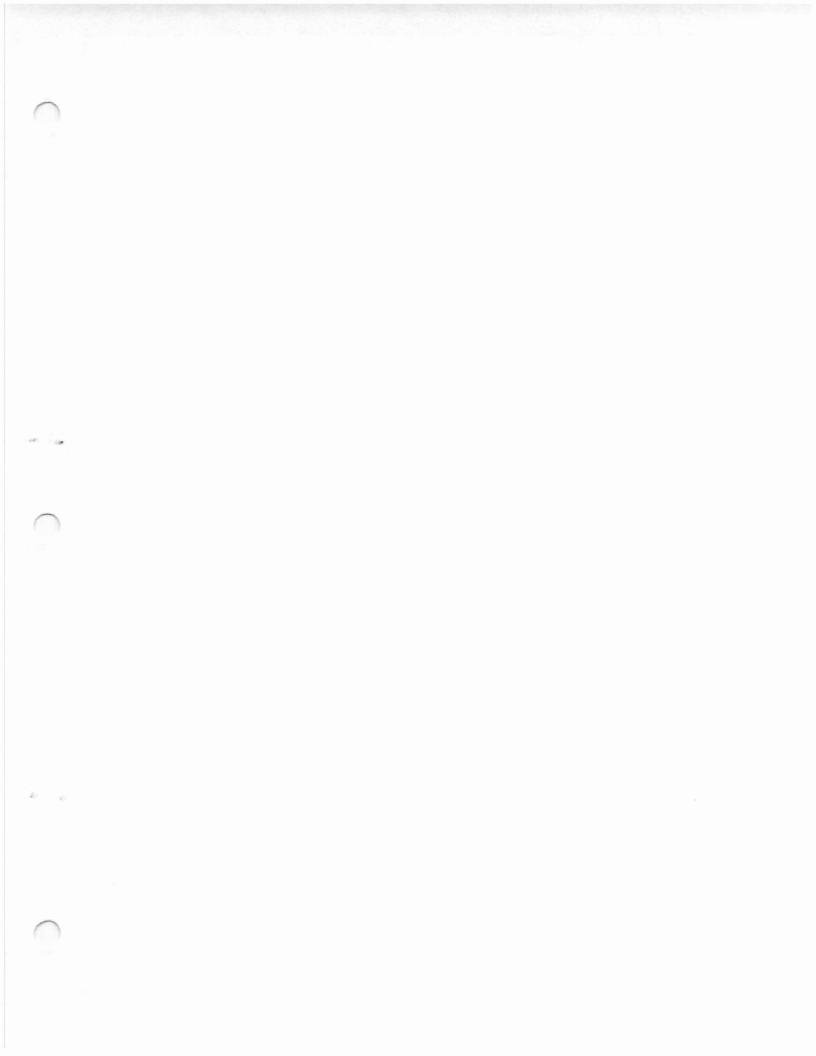




FIGURE 5-10 WITCO CORPORATION Toluene, Ethylbenzène and Naphthalene Trend Plots MW-11S

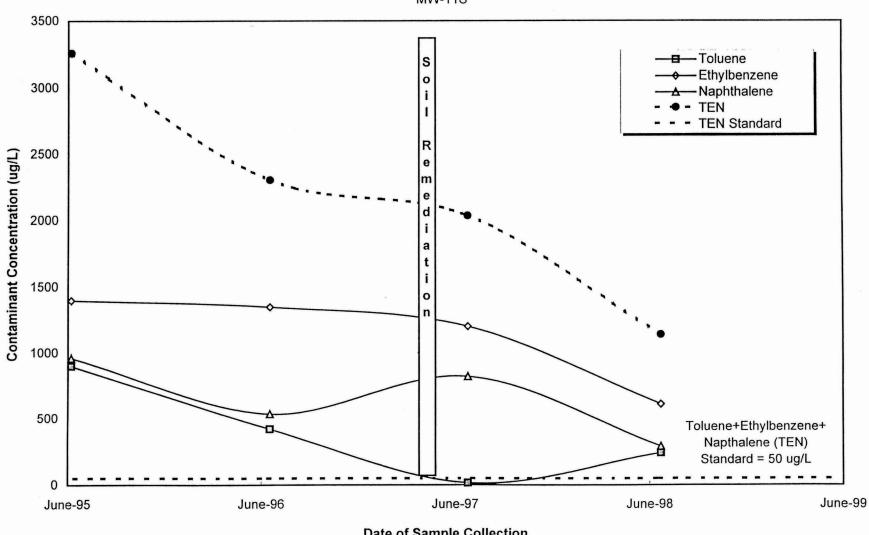
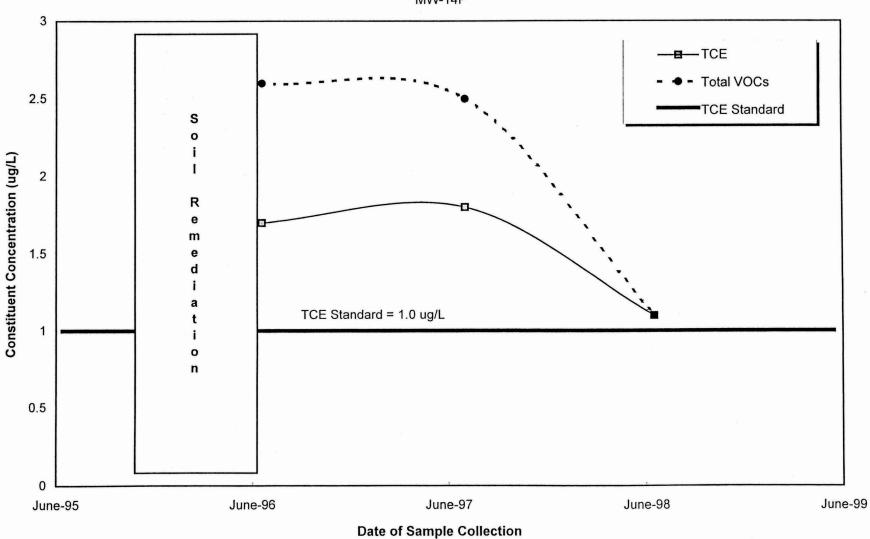
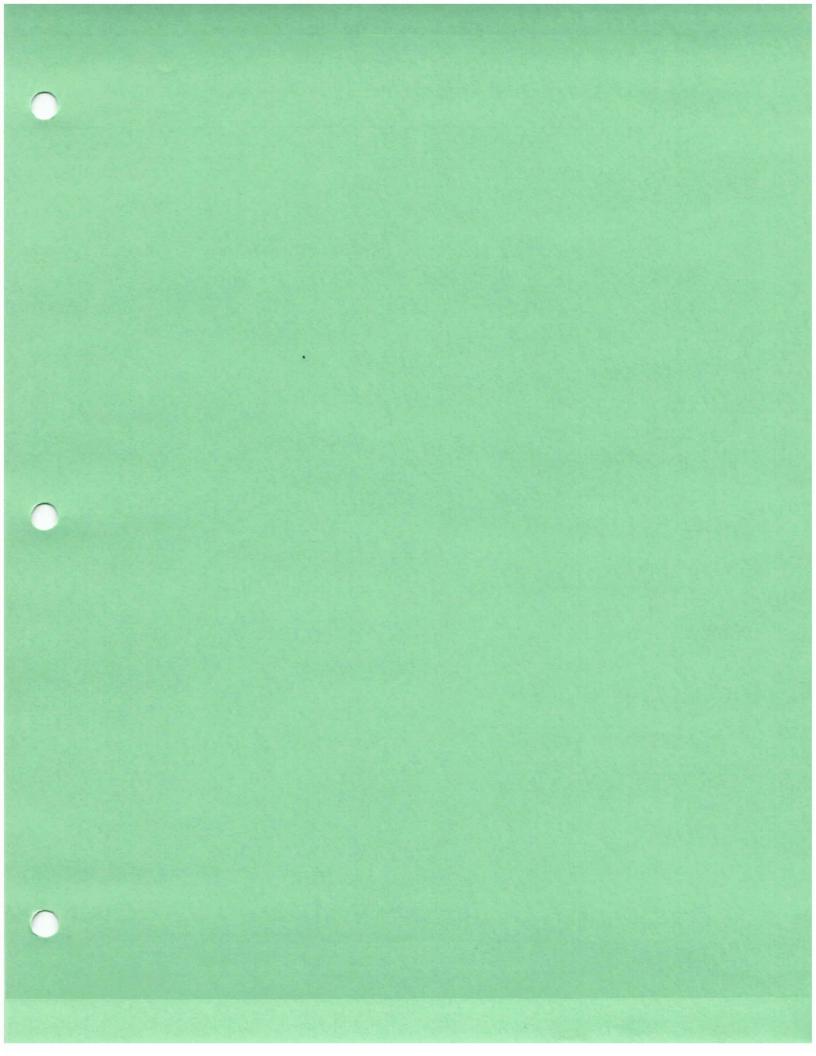


FIGURE 5-11
WITCO CORPORATION
TCE and Total VOCs Trend Plots
MW-14P





APPENDIX C

PROPOSED CLASSIFICATION EXCEPTION AREA (CEA) NOTIFICATION LETTER

State of New Jersey
Department of Environmental Protection
Division of Responsible Party Site Remediation
Bureau of State Case Management
401 East State Street
CN 028
Trenton, NJ 08625

Attention:

Mr. Gary Lipsius

SUBJECT:

Classification Exception Area Witco Perth Amboy, NJ Facility Site List No: NJD002165561

Dear Mr. Lipsius:

In order to achieve a conditional No Further Action determination, a Classification Exception Area (CEA) will be established for groundwater underlying the Witco Perth Amboy Facility. The boundaries of the CEA, the contaminants for which the area is being restricted, the longevity of the CEA, and necessary public notifications are described succinctly below. A more detailed discussion of these parameters can be found in Section 4.0 of the Draft Remedial Action Report Addendum, Date TBD 1999.

Boundaries

The boundaries of the CEA for the Witco Perth Amboy Facility will be the site property boundaries. The site is an active manufacturing facility located at 100 Convery Boulevard in Perth Amboy, NJ. It is bounded on the north by the Spa Creek and the properties of Russell Stanley, on the east by Amboy Avenue, on the south by Chevron Oil Company, and on the west by Convery Boulevard. Figure 1 depicts the boundaries of the CEA. The CEA occupies multiple blocks and lots including: block 470, lots 1.01 and 1.02; block 471, lot 1; block 472.03, lots 1-13, 30, and 32-25; and block 470, lot 1.01.

The Woodbridge Member of the Raritan Formation is the impacted aquifer. This is the uppermost unconfined aquifer in the area. There is no evidence that the underlying Farrington member has been impacted; therefore, it is not included in the CEA.

Contaminants

Residual groundwater contamination remains on-site at levels exceeding ground water quality standards (GWQS). Groundwater contaminants for which this area is being restricted include the following: chloromethane, methylene chloride, 1,1-dichloroethene, cis-1,2-dichloroethene, trichloroethene, benzene, toluene, ethylbenzene, and xylene.

Mr. Gary Lipsius Date TBD Page 2

Longevity

A CEA is in effect for a specified period of time, which is usually based on the amount of time estimated to reduce contaminant levels within the aquifer to below GWQS. In addition, NJDEP requirements for natural remediation, which is the proposed remedial action for this site (see Section 3.0 of the RAR Addendum), include a minimum of eight rounds of ground water sampling. To date, four rounds of ground water sampling have been completed. Four more years of annual monitoring are propsed in order to meet the NJDEP requirement. Therefore, the proposed longevity of the CEA is four years.

Public Notice Requirements

NJAC 7:26E-6.2(a)17v requires that notice be sent to the local health department and township clerk when a CEA is put into effect. Consistent with NJDEP regulations, the following will be included in the notifications to the Perth Amboy township clerk and health department officials:

- 1. Name and address of person responsible for implementing CEA
- 2. The name of the site
- 3. Site EPA identification number
- 4. Street address and lot and block numbers
- 5. Brief description of the current use and occupancy of the site
- 6. The nature of the remedial action to be performed and projected duration
- 7. The anticipated start date of the remedial action
- 8. Location of the site in GIS-compatible format
- 9. The limitation on groundwater usage based on the contamination present and the proposed remedial action
- 10. Copy of document identifying engineering or institutional controls on groundwater

Local officials have been contacted regarding present and future use of groundwater in the area. The limited wells within a one-mile radius are used for industrial purposes. Perth Amboy and Woodbridge officials report that none of the wells in the area are used as sources of potable water. Furthermore, there are no long-terms plans to use the aquifer as a source of potable water.

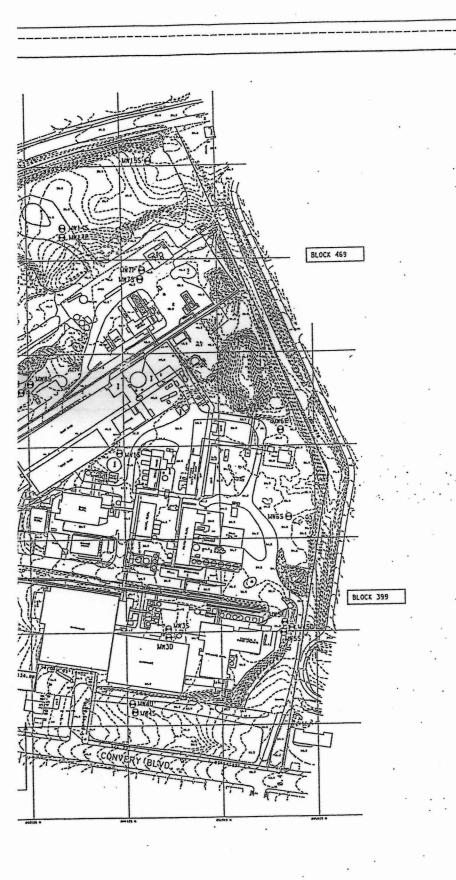
If you have any questions or comments, please call me at (732) 826-6600.

Sincerely,

WITCO CORPORATION

John Raspa

Attachment (Figure 1)



LEGEND:

WETLAND

50' BUFFER PROPERTY LINE AND CEA LIMIS

EXISTING CONTOUR

TREE LINE EXISTING RAILROAD

EXISTING FIRE HYDRANT

MONITORING WELL IN GROUNDWATER SAMPLING PROCRAM (LOCATIONS APPROXIMATED FROM RIFFS PLATE 2-7. LAWLER MATUSKY AND SKELLY 1990)

CLASSIFICATION EXCEPTION AREA (CEA) BOUNDARIES

FIGURE 1

WITCO CORPORATION PERTH AMBOY, NEW JERSEY



1 17180-2-40-C01

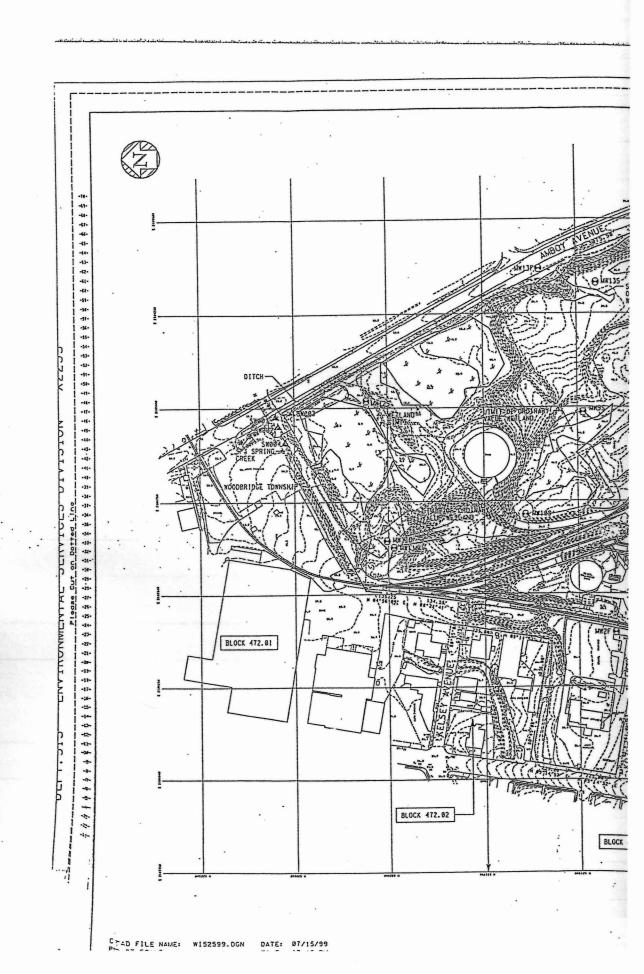


EXHIBIT C

INSTITUTIONAL CONTROLS AND ASSOCIATED MONITORING AND MAINTENANCE ACTIVITIES

All affected areas in the Deed Notice have engineering controls in place. The controls consist of a minimum of 2 feet of clean soil cover in the contaminated areas (Figures B-2.1 through B-2.5). In addition, in the heater pad area, the clean soil is separated from the contaminated soil at the bottom of the excavation by a PVC liner.

Any work performed in the contaminated areas designated on Figures B-2.1 through B-2.5 will be performed under the guidance of both a health and safety plan and a work plan. These plans will address issues such as personal protective equipment, sampling of excavated material, real-time air monitoring, management of contaminated spoils, erosion control, and site restoration.

The clean soil cover was hydroseeded after installation and the resulting vegetative layer is inspected and maintained regularly. If erosion or loss of cover soil occurs, Witco will replace the soil to maintain the minimum 2-foot thick cover and revegetate to prevent erosion.

Witco operations personnel periodically inspect water collection standpipes in the heater pad area and pump accumulated liquids, as necessary. Cracks or other damage to the concrete caps in the heater pad area will be repaired if they are observed by Facility personnel.



Bcc

CE file 600-597-10.14 (Complete submittal with all att's)

M. Pittignano w/ revised deed notice and Fig B-3 (All other Atts in RAR Adden)

J. Raspa- ditto

Perth Amboy

FWENC

S. Weber- ditto P. Missal- ditto

Middlebury Law Department

December 7, 1999

Mr. Gary Lipsius
New Jersey Department of Environmental Protection
Division of Responsible Party Site Management
Bureau of State Case Management
401 East State Street
CN 028
Trenton, NJ 08625

SUBJECT:

SUBMITTAL OF REVISED DEED NOTIFICATION

CKWITCO CORPORATION, PERTH AMBOY PLANT CLEANUP

Dear Mr. Lipsius:

Per your letter dated September 16, 1999, we are submitting a revised Deed Notice including a map (Fig B-3) demarcating areas in exceedance of NJDEP's unrestricted use (i.e. residential) soil cleanup criteria and resolution of the two PCB anomaly areas.

Included in this submittal please find the following;

- Submittal certification letter
- (2) copies of the revised Deed Notice

Please review the submittal so we may proceed to submit the Deed Notice to Middlesex County.

If you should have any questions feel free to call me at 203-552-2408.

Sincerely,

Stephen D. Kohlhase

Witco

Witco Corporation 1000 Convery Boulevard Perth Amboy, NJ 08862 (732) 826-6600 (732) 826-5408 Fax

December 7, 1999

Mr. Gary Lipsius
New Jersey Department of Environmental Protection
Division of Responsible Party Site Management
Bureau of State Case Management
401 East State Street
CN 028
Trenton, NJ 08625

SUBJECT: CERTIFICATION OF SUBMITTAL OF REVISED DEED NOTIFICATION CKWITCO CORPORATION, PERTH AMBOY PLANT CLEANUP

Dear Mr. Lipsius:

In accordance with the requirements for certification of reports per N.J.A.C. 7:26C-1-2, we submit the following, concerning the revised Deed Notification identifying those areas above NJDEP Residential criteria but below site cleanup standard for the Perth Amboy on site PCB remediation work.

"I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, to the best of my knowledge, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."



"I certify under penalty of law that I am fully aware of the requirements of N.J.S.A. 58:10B-3 et seq., as they pertain to remediation funding sources. Specifically, I am aware of my responsibilities in the establishment and maintenance of a remediation funding source. Additionally, I acknowledge that this remediation funding source shall be maintained until such time as I have submitted an alternative remediation funding source to the Department and it has been approved by the Department in writing or I have been notified by the Department in writing that I am no longer required to maintain a remediation funding source. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

CKWITCO CORPORATION

Bv:

Ridard P. Lissender

Title

PLANT MANAGER.

Sincerely,

Richard Lissenden Plant Manager

CKWitco Corporation

NOTARIZATION

CORINNE FITZSIMMONS
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires April 15, 2002

DEED NOTICE

IN ACCORDANCE WITH N.J.S.A. 58:10B-13, THIS DOCUMENT IS TO BE RECORDED IN THE SAME MANNER AS ARE DEEDS AND OTHER INTERESTS IN REAL PROPERTY.

| Prepared by: | • |
|--|--|
| [Signature] | · · |
| [Print name below signature] | |
| Recorded by: | |
| [Signature, Officer of County Rec | ording Office] |
| [Print name below signature] | |
| DEED | NOTICE |
| This Deed Notice is made as of th | e, day of, by CKWitco |
| orporation (together with his/her/its/th | eir successors and assigns, collectively |
| Owner"). | |

WITNESSETH:

WHEREAS, Owner is the owner in fee simple of certain real property designated as the following Blocks and Lots; Block 471 Lot 1; Block 470, Lots 1.01 & 1.02; Block 472.03, Lots 1-13, & 30 & 32-35; and Block 474, Lot 1.01, on the tax map of the City of Perth Amboy, Middlesex County, New Jersey Department of Environmental Protection Known Contaminated Site List Number NJD002165561, more particularly described on Exhibit A attached hereto and made a part hereof (the "Property"); and

WHEREAS, the New Jersey Department of Environmental Protection ("Department") approved a remedial action on June 1, 1995 for NJD002165561/CKWitco Corporation Perth Amboy Site Convery Boulevard concerning the Property in which the Department has approved the use of institutional controls and/or engineering controls in accordance with N.J.S.A. 58:10B-13; and

WHEREAS, this Deed Notice itself is not intended to create any interest in real estate in favor of the Department, nor to create a lien against the Property, but merely is intended to provide record or deed notice of certain conditions and restrictions on the property and to reflect the regulatory and statutory obligations imposed as a condition of using institutional and/or engineering controls; and

WHEREAS, the areas described on Exhibit B attached hereto and made a part hereof (the "Affected Areas") contain contaminants above the applicable remediation standards that would allow for the unrestricted use of the Property; and

WHEREAS, the type, concentration and specific location of the contaminants are described on one or more diagrams, maps and/or tables on Exhibit B attached hereto and made a part hereof; and

WHEREAS, a narrative description of all institutional controls and associated monitoring and maintenance activities are provided in Exhibit C; and

WHEREAS, to prevent the potential for migration of the contaminants and unacceptable risk of exposure to the contamination to humans or the environment, permeable surface covers and asphalt covers are in place at the Property, at the locations shown in Exhibit B on maps titled Figure B-2.1, Figure B-2.2, Figure B-2.3, Figure B-2.4, Figure B-2.5 and Figure B-3; and

WHEREAS, to prevent the potential for unacceptable exposure to the contamination to humans or the environment a liner is in place at the Property, at the locations shown in Exhibit B on the map titled Figure B-2.1; and

WHEREAS, in accordance with the Department's approval of the Remedial Action Work Plan, and in consideration of the terms and conditions of that

approval, and other good and valuable consideration, Owner has agreed to subject the Property to certain statutory and regulatory requirements which impose restrictions upon the use of the Property, and to restrict certain activities at the Property, as set forth below.

NOW, THEREFORE, Owner agrees to the conditions and restrictions listed below and hereby notifies all interested parties, owners, lessees and operators that the applicable regulations and statutes require of such person while owning, leasing or operating the Property as follows:

1. RESTRICTED USES. The owner(s) of all or any fee interest in all or any portion of the Affected Areas and each operator of all or any portion of the Affected Areas, shall not allow any of the following uses of the following portions of the Affected Areas:

Portion of the Affected Area The Affected Engineering Control Area as identified in Exhibit B, Figures B-2.1, B-2.2, B-2.3, B-2.4, B-2.5 and B-3.

The Other Affected Areas as identified in Exhibit B, Figure B-3.

Restricted Use

The use shall be restricted to. non-residential uses only and pursuant to Paragraphs 2 and 3.

2. EMERGENCIES. In the event of an emergency which presents a significant risk to public health, safety, or the environment, the application of

Paragraph 1 above may be temporarily and unilaterally suspended, by Owner, provided that the Owner:

- i. Immediately notifies the Department of the emergency;
- ii. Limits both the actual disturbance and the time needed for the disturbance to the minimum reasonably necessary to adequately respond to the emergency;
- iii. Implements all measures necessary to limit actual or potential, present or future risk of exposure to humans or the environment to the residual contamination; and
- iv. Restores the Affected Areas to the pre-emergency conditions to the extent reasonably possible, and provides a report to the Department of such emergency and restoration efforts within ninety (90) calendar days after the end of the emergency.
 - 3. ALTERATIONS, IMPROVEMENTS, AND DISTURBANCES.
- (a) Except as provided in Paragraph 2 above, no owner or operator shall make, or allow to be made, any alteration, improvement, or disturbance in, to, or about the Affected Areas which disturbs any engineering control or which creates an unacceptable risk of exposure of humans or the environment to contamination in the Affected Areas without first obtaining the express written consent of the Department. Nothing herein shall constitute a wavier of the Owner's or operator's obligation to comply with all applicable laws and regulations.

- (b) Notwithstanding subparagraph 3(a) above, the Department's consent is not required for any alteration, improvement, or disturbance provided the Owner or operator;
- i. Provides for restoration of any disturbance of an engineering control to pre-disturbance conditions within sixty (60) calendar days after the initiation of the alteration, improvement or disturbance; and
- ii. Does not allow an exposure level above those noted under Restricted Uses, provided that all applicable worker health and safety laws and regulations are followed during the alteration, improvement, or disturbance.
- 4. ACCESS. While this Deed Notice is in effect, the Owner agrees to allow the Department, its agents and representatives access to the property to inspect and evaluate the continued effectiveness of the institutional or engineering controls and to conduct additional remediation to ensure the protection of the public health and safety and the environment.
- 5. NOTICE TO LESSEES AND OTHER HOLDERS OF PROPERTY
 INTERESTS. Owner shall cause all leases, grants, and other written transfers of interest in the Affected Areas to contain a provision expressly requiring all holders thereof to take the Property subject to the restrictions contained herein and to comply with all, and not to violate any of the conditions of this Deed Notice.

 Nothing contained in this Paragraph shall be construed as limiting any obligation

of Owner to provide any notice required by any law, regulation, or order of any governmental authority.

- 6. ENFORCEMENT OF VIOLATIONS. The restrictions provided herein may be enforceable solely by the Department against any person who violates this Deed Notice. A violation of this Deed Notice shall not affect the status of the ownership of or title to the Property. To enforce violations of this Deed Notice, the Department may initiate one or more enforcement actions pursuant to N.J.S.A. 58:10-23.11u and, require additional remediation and assess damages pursuant to N.J.S.A. 58:10-23.11g.
- 7. SEVERABILITY. If any court of competent jurisdiction determines that any provision of this Deed Notice is invalid or unenforceable, such provision shall be deemed to have been modified automatically to conform to the requirements for validity and enforceability as determined by such court. In the event that the provision invalidated is of such a nature that this provision cannot be so modified, the provision shall be deemed deleted from this instrument as though it had never been included herein. In either case, the remaining provisions of this Deed Notice shall remain in full force and effect.
- 8. SUCCESSORS AND ASSIGNS. This Deed Notice shall be binding upon Owner and upon Owner's successors and assigns while each is an owner or operator of the Property, and the Department.

9. REQUIREMENT OF NOTIFICATION. The Owner shall notify any person who intends to excavate on the property of the nature and location of any contamination existing on the property and of any conditions or measures necessary to prevent exposure to contaminants.

10. TERMINATION AND MODIFICATION

- (a) This Deed Notice shall terminate only upon filing of an instrument, executed by the Department, in the office of the County Clerk/Register of Deeds and Mortgages of Middlesex County, New Jersey, expressly terminating this Deed Notice.
- (b) Any person may request in writing at any time that the Department modify or terminate this Deed Notice or initiate termination proceedings based on, for example, a proposal that the Property does not pose an unacceptable risk to public health and safety or the environment. Within ninety (90) calendar days after receiving such a request the Department will either:
 - i. Approve the request and have the Owner:
- Record with the office of the county recording officer a notice executed by the Department that the use of the Property is no longer restricted and the Deed Notice is terminated or record a modified Deed Notice delineating the new restrictions; and

-Provide written notice to each municipality in which the Property is located, with a copy to the Department, of the removal or change of the restrictions contained herein; or

- ii. Issue a written notification of intent to deny the request pursuant to (c) below.
- (c) The Department will set forth in a notice of intent to deny a request to modify or terminate this Deed Notice the basis for its decision. The owner can respond to the intent to deny by providing new or additional information or data. The Department will review any such new or additional information or data and issue a final decision to grant or deny the request within sixty (60) calendar days after the Department's receipt of the owner's response.

IN WITNESS WHEREOF, Owner has executed this Deed Notice as of the date first written above.

| ATTEST: CKWitco Corporation | | |
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| | By | |
| | | |
| [Print name and title [If Owner is a corpo STATE OF NEW JI COUNTY OF MID I certify that Owner] personally my satisfaction, tha | oration] ERSEY SS.: DLESEX on , 19 , [Name of person executing document on behalf of came before me, and this person acknowledged under oath, to | |
| (a) this perso corporation named | n is the [secretary/assistant secretary] of [Owner], the in this document; | |
| | on is the attesting witness to the signing of this document by the ficer who is the [president/vice president] of the corporation; | |
| | ment was signed and delivered by the corporation as its vas duly authorized; | |
| (d) this person to this document; a | on knows the proper seal of the corporation which was affixed and | |
| (e) this perso | on signed this proof to attest to the truth of these facts. | |
| | | |
| | [Print name and title of attesting witness] | |
| | Signed and sworn before me on , 19 | |
| | , Notary Public | |
| | [Print name and title] | |

EXHIBIT C

INSTITUTIONAL CONTROLS AND ASSOCIATED MONITORING AND MAINTENANCE ACTIVITIES

There are two types of affected areas identified in the Deed Notice, Affected Engineering Control Areas and Other Areas. Affected Engineering Control Areashave engineering controls in place. The controls consist of a minimum of 2 feet of clean soil cover in the contaminated areas (Figures B-2.1 through B-2.5). In the heater pad area, the clean soil is separated from the contaminated soil at the bottom of the excavation by a PVC liner. At two locations depicted on Figure B-3, asphalt covers have been installed to control exposure to contaminated soil. Other Areas depicted on Figure B-3 have contamination in soil above residential remediation standards but below the remediation standard for the Property. The Other Areas do not have engineering controls in place and exposure will be controlled through use of institutional controls with associated monitoring and maintenance activities.

Any work performed in the contaminated areas designated on Figures B-2.1 through B-2.5 and Figure B-3 will be performed under the guidance of both a health and safety plan and a work plan. These plans will address issues such as personal protective equipment, sampling of excavated material, real-time air monitoring, management of contaminated spoils, erosion control, and site restoration.

The clean soil cover was hydroseeded after installation and the resulting vegetative layer is inspected and maintained regularly. If erosion or loss of cover soil occurs, CKWitco Corporation will replace the soil to maintain the minimum 2-foot thick cover and revegetate to prevent erosion.

CKWitco Corporation operations personnel periodically inspect water collection standpipes in the heater pad area and pump accumulated liquids, as necessary. Cracks or other damage to the concrete caps in the heater pad area will be repaired if they are observed by Facility personnel. In addition, CKWitco Corporation

operations personnel will periodically inspect the asphalt covers for cracks and loss of integrity. Cracks or damage to asphalt covers will be repaired if they are observed by Facility personnel.



DCC

CE file 600-597-10.14 (Complete submittal with all att's) FOR ALL

M. Pittignano w/ revised dued notice and F

J. Raspa- ditto

Perth Amboy

S. Weber-ditto

FWENC

P. Missal-ditto

Middlebury Law Department

December 17, 1999

Mr. Gary Lipsius New Jersey Department of Environmental Protection Division of Responsible Party Site Management Bureau of State Case Management 401 East State Street CN 028 Trenton, NJ 08625

GMbluhur-12/17/89

ruden)

SUBJECT:

SUBMITTAL OF REMEDIAL ACTION REPORT ADDENDUM NO. 2 CK WITCO CORPORATION, PERTH AMBOY PLANT CLEANUP NJDEP CONTAMINATED SITE LIST NUMBER NJD002165561

Dear Mr. Lipsius:

Enclosed for your review and approval are documents that comprise Addendum No. 2 of our Remedial Action Report (RAR) for CK Witco's Perth Amboy, NJ facility submitted to NJDEP in December 1998. A previous Addendum was submitted to NJDEP in July 1999 to document remedial activities performed after submittal of the RAR and present our proposed Classification Exception Area (CEA), Natural Groundwater Remediation Proposal, and Deed Notice for the facility. Addendum No. 2 has been prepared to document additional remedial activities conducted by CK Witco at the facility since our submittal of the RAR Addendum

On September 16, 1999, NJDEP issued comments on the previous Addendum related to the draft Deed Notice. Enclosure 1 presents a copy of the comment letter, which requested demarcation of PCB contamination areas that exceed NJDEP's unrestricted use direct contact soil criteria (PCB concentration greater than 0.49 mg/kg). Our proposed Deed Notice demarcated areas with engineering controls covering soils with PCB concentrations in excess of the site-specific cleanup criterion of 2 mg/kg. reviewed historic data to respond to NJDEP's comment, we discovered two areas of concern with PCB soil concentrations exceeding 2 mg/kg not addressed during previous remedial actions. One area was located along the eastern boundary of the property adjacent to our administrative parking lot and security fence; the other area was situated in the northern portion of our property adjacent to our rail spur and gate access. CK Witco provided verbal notification to NJDEP of the two areas and elected to install engineering controls (asphalt caps) to control exposure to PCB contamination based upon discussions with the Department.

Mr. Gary Lipsius December 17, 1999 Page 2

In October 1999, Foster Wheeler Environmental, our consultant for RAR activities, evaluated the two areas of concern and developed engineering sketches and details for the placement of engineered asphalt covers. Enclosure 2 contains their transmittal of the cover details to us. You will note that their transmittal referenced the NJDEP-approved Work Plan and management of excavation wastes in accordance with Department and USEPA requirements.

CK Witco installed the engineered asphalt covers at the two areas of concern between November 4 and 22, 1999. IT Corporation, our contractor for RAR activities, installed the covers in accordance with the NJDEP-approved Work Plan at the locations identified by Foster Wheeler Environmental. Enclosure 3 contains IT Corporations letter report for the field activities, including as-built conditions and asphalt documentation.

IT Corporation collected samples from excavated spoils on November 16, 1999 and submitted them for PCB analysis and waste characterization to 21st Century Environmental, an NJDEP-certified laboratory. Enclosure 4 contains the results of the waste characterization analysis and the manifest for disposal of spoils at Grows Landfill in Pennsylvania. The low concentration of total PCBs in the waste characterization sample facilitated disposal at Grows Landfill in accordance with Department and USEPA requirements.

On December 7, 1999 CK Witco submitted a Revised Deed Notification to NJDEP. Enclosure 5 contains a copy of the submittal. The Revised Deed Notification responded to the Department's September 16, 1999 comment letter by demarcating areas in exceedance of NJDEP's unrestricted use soil cleanup criterion. The revision also demarcated the two areas concern where CK Witco installed engineered asphalt caps. Revised Deed Notice text was included with the submittal for Department review and approval.

With this submittal of Addendum No. 2, CK Witco satisfies requirements of the September 10, 1985 "Stipulation of Settlement" as amended in the "Second Amendment to the Stipulation of Settlement, "dated January 12, 1993. CK Witco has conducted all work in accordance with the NJDEP-approved Work Plan and has satisfactorily addressed NJDEP's comments to date. Enclosure 6 presents CK Witco's certification letter to this effect.

Mr. Gary Lipsius December 17, 1999 Page 3

CK Witco respectfully requests that the Department conclude its review of the RAR and issue a restricted No Further Action (NFA) determination so that we may file the Deed Notice with Middlesex County and initiate compliance activities proposed in the July 1999 RAR Addendum. We appreciate your cooperation and guidance to date and hope we can conclude this matter shortly. If you have any questions, feel free to call me at 203-552-2408.

Sincerely,

Stephen D. Kohlhase

ENCLOSURE 1

NJDEP COMMENT LETTER ON REMEDIAL ACTION REPORT ADDENDUM AND DRAFT DEED NOTICE SEPTEMBER 16, 1999



State of New Jersey

Christine Todd Whitman Governor

Department of Environmental Protection

Robert C. Shinn, Jr. Commissioner

Z394 321 632 <u>Certified mail</u> <u>Return reeceipt requested</u>

SEP 1 6 1999

Mr. Stephen Kohlhase, Site Manager Witco Corporation One American Lane Greenwich, CT 06831

Dear Mr. Kohlhase:

Re: Witco Chemical Corporation, Perth Amboy, Middlesex County Facility

As you are aware, NJDEP is currently reviewing the Remedial Action Report (RAR) Addendum (July 1999). This addendum was submitted in response to NJDEP's comments transmitted to Witco regarding the Remedial Action Report dated November 1998.

NJDEP requires that, prior to the granting of a restricted No Further Action (NFA) determination, Witco must execute and submit an appropriately completed Deed Notice to the Middlesex County. Accordingly, Witco submitted a draft Deed Notice to NJDEP with the RAR Addendum for NJDEP's approval. As a result of NJDEP's review of the draft Deed Notice, NJDEP has determined that the figures submitted as part of the draft Deed Notice depicting the extent of contamination will require revision and re-submission to NJDEP prior to approval. Specifically, Figures B-2.1 through 2.5 depict areas of the site where engineering controls have been implemented at the site where soil contamination exceeds NJDEP's Non-Residential Direct Contact Soil Cleanup Criteria. However, N.J.A.C. 7:26C-1.3 and N.J.S.A. 58:10B-1 require that the Deed Notice demarcate areas of contamination that exceed NJDEP's unrestricted use (i.e. residential) direct contact soil cleanup criteria. Although Figures B-2.1 through 2.5 should be retained as part of the Deed Notice since these figures demarcate areas where engineering controls have been implemented, an additional drawing is required that will depict areas of concern at the site where contamination exceeds the unrestricted use soil cleanup criteria.

Mr. Stephen Kohlhase Witco Corporation Page 2 of 2 09/15/99

Accordingly, within 30 Calendar days from the date of receipt of this letter, Witco should submit the revised Deed Notice as set forth above. Subsequent to NJDEP approval of the draft Deed Notice, Witco shall execute and file the deed notice with Middlesex County consistent with N.J.A.C. 7:26C. In the interim, please feel free to contact me for any reason at 609-984-0955.

Sincerely

Gary Lipsius, Case Manager

Bureau of State Case Management

c. Andrew Marinucci, NJDEP/BEERA
 David Kaplan, NJDEP/BGWPA
 Andrew Park, USEPA RCRA Program

ENCLOSURE 2

SKETCHES AND PAVING DETAILS FOR PCB AREAS OF CONCERN FOSTER WHEELER ENVIRONMENTAL, OCTOBER 29, 1999



October 29, 1999 1908-99X-021

Mr. Stephen Kohlhase CK Witco Corporation One American Way Greenwich, CT 06831-2559

SUBJECT:

SKETCHES AND PAVING DETAILS FOR PCB AREAS OF CONCERN

CK WITCO PERTH AMBOY, NJ FACILITY

PURCHASE ORDERS 690-11819

Dear Mr. Kohlhase:

Enclosed for your use are three sketches with plan and cross-sectional depictions of asphalt cover systems for identified areas of concern at the Perth Amboy, NJ facility. These sketches were generated based upon our site visit and discussions on Wednesday, October 27. Following your request, Foster Wheeler Environmental generated the enclosed sketches, which will be used by your construction contractor, to guide placement of a suitable asphalt cover over PCB areas of concern. It is our understanding that PCB excavation activities will be conducted in accordance with the NJDEP-approved Work Plan and the construction contractor will implement health & safety, regulatory compliance, and waste management plans accordingly. Since there are PCBs present in surface soils that will be removed as part of cover placement, we anticipate that containerization, characterization, and disposal of wastes will be performed in accordance with NJDEP and USEPA requirements. We understand that you do not foresee the need of our services during cover system installation for oversight or inspection.

Concurrent with cover system installation, Foster Wheeler Environmental will update the draft Deed Notice figure sent to CK Witco on October 8, 1999 to reflect additional areas with engineering controls. This figure can then be forwarded to NJDEP to satisfy their comments on the Deed Notice and allow them to proceed with issuance of a No Further Action determination for the site. We understand that we will generate a letter report addendum for the new asphalt covers after installation is complete and your construction contractor provides us with complete documentation, including waste disposal manifests.

As discussed during the site visit, this work represents a change to our existing scope of work. Foster Wheeler Environmental will issue a change order request after identified activities are complete for your approval. If you have any questions or need additional information, please call me at (973) 597-7039.

Very truly yours.

Steven B. Weber, P.E.

Project Manager

Enclosure

cc:

L. Haymon M. Junghans



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ENCLOSURE 3

LETTER REPORT FOR INSTALLATION OF ASPHALT COVERS IT CORPORATION, NOVEMBER 22, 1999

- LETTER REPORT
- AS-BUILT CONDITIONS
- ASPHALT DOCUMENTATION



November 22, 1999

Witco Corporation
One American Lane
Grreenwich, CT 06831-2559
Attn: Mr. Steve Kohlhase

Subject: Asphalt Covers for the PCB Areas of Concern

CK Witco Perth Amboy, New Jersey Facility

Dear Mr. Kolhase:

IT Corporation Inc. (IT) is pleased to submit the closure documentation for the construction of Asphalt Covers over the PCB areas of concern at the CK-Witco facility in Perth Amboy, New Jersey.

IT was retained by CK-Witco to perform the work outlined in Foster-Wheeler's letter (with attachments) to Witco dated October 29, 1999. The scope of work consisted of asphalt capping at two locations at the Perth Amboy Plant. The two cap areas are clearly delineated in Foster Wheeler's 29 October letter and were staked out in the field by Foster Wheeler personnel. Shallow soil excavation and removal activities were performed at both cap locations but only to accommodate the required asphalt cap thickness. Record drawings of the work completed are attached to this letter. The work was performed between November 4th and November 22nd, 1999.

On November 4, 1999, IT mobilized personnel (a Project Engineer, a Lead Operator and a Field Technician) and equipment (Cat 516 backhoe, vehicles and tools) to perform the required scope of work. The first cap area to be addressed was in the front parking lot of the Perth Amboy Plant along the Convery Boulevard fenceline. IT used a small backhoe to remove the existing asphalt from the area delineated by Foster-Wheeler. The material removed consisted of 2 layers of asphalt over an aggregate sub-base. IT removed 6 to 7 inches of the material; both layers of asphalt and a portion of the sub-base. No subsurface soil was removed. The material was placed in a roll-off and hauled to an asphalt recycler, S. D. G. Aggregate, Inc., located in Cateret, New Jersey. Approximately 12 yards of material was generated.

Witco - Correspondence To: Mr. Steven Kolhase

The second asphalt cap was to be constructed along the rail line entering the plant immediately adjacent to the rail access gate. In the area just outside of the railbed limits IT personnel utilized the excavator to remove existing vegetation and about 3 inches soil. Within the railbed itself IT personnel performed hand excavation to remove 3 inches of ballast and soil between the ties and between 4 and 5 inches of ballast and soil outside of the ties. During the removal activity care was taken to grade the overall area to drain away from the tracks. Excavated material was placed in a rolloff and subsequently sampled for transportation and disposal. A 5-point composite sample was collected from the approximately 16 cubic yards of soil and ballast in the roll-off and submitted to 21st Century Environmental located in Bridgeport, New Jersey for analysis. Twenty-first Century analyzed the sample for Total PCBs using Method 8081 the and found less than 1 ppm in the sample. It is anticipated that soil in the roll-off box will Inc.'s GROWS facility in transported to Waste Management, southeastern Pennsylvania for disposal.

IT retained Kistler Paving to perform the asphalt cap placement over the excavated areas. On November 19, 1999, IT and its asphalt subcontractor mobilized to the site. Work began in the parking lot area of concern. IT placed and compacted a minimum of $2\frac{1}{2}$ inches of dense graded aggregate. 2 inches of Base Course bituminous concrete was then placed and rolled followed by $1\frac{1}{2}$ inches of Top Course bituminous concrete.

At the area of concern adjacent to the railroad gate, IT placed and compacted approximately 2½ inches of dense graded aggregate. This subbase was blended into the existing ballast in this area as typical railroad ballast does provide a suitable sub-base for the asphalt layer. Bituminous concrete was placed over the prepared sub-base and compacted per the specification. It should be noted that the areas between the rails were compacted with a hand-tamper.

If you have any questions please contact me at (609) 584-6822 or George Arbutina at (609) 588-6338.

Sincerely,

Just 14

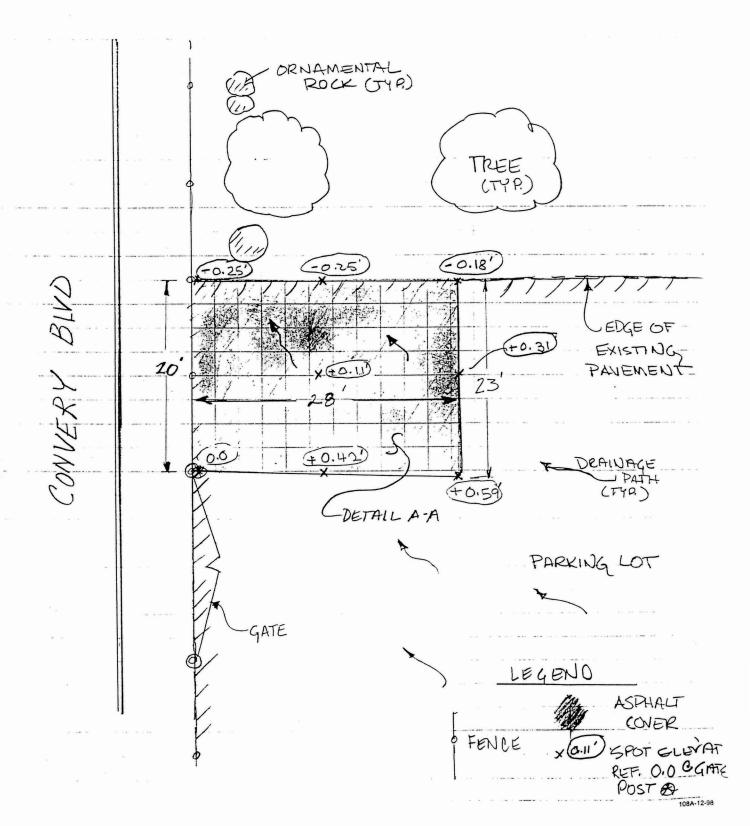
IT_Corporation

Kelly Fagan Project Engineer

Attachments

Cc: G. Arbutina, IT



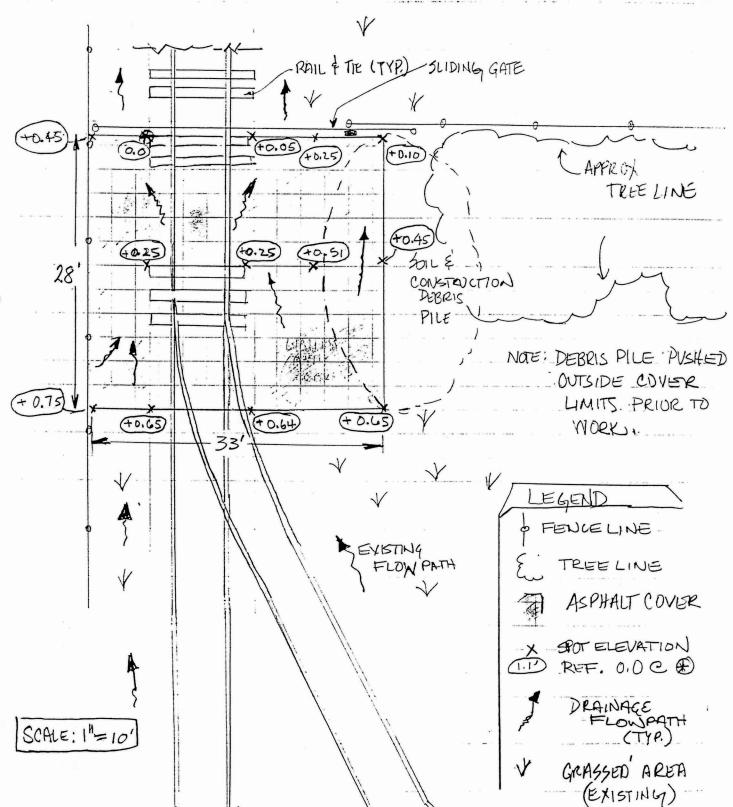






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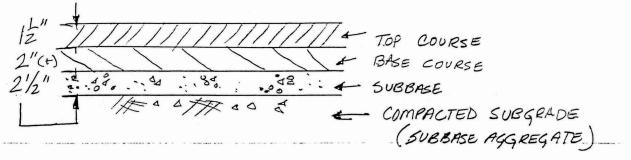
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When ordered to cross curb-line we do so at your risk and will not be responsible for broken walks, driveways, etc.

CUSTOMER'S COPY

HAZARD WARNING

THERMAL BURNS FROM CONTACT WITH HOT LIQUID, INHALATION AND EYE IRRITATION HAZARDS FROM HYDROGEN SULFIDE GAS

No. 074638

SOLD TO

DAILY PRODUCT TONS

REC'D. BY

RISTLER PAVING INC. ISH IN. NJ Marie Tradición DELIVER F. J. A



FOOT OF CROWS MILL ROAD KEASBEY, N.J. 08832 (732) 738-4222

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When ordered to cross curb line we do so at your risk and will not be responsible for broken walks, driveways, etc.

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CUSTOMER'S COPY

HAZARD WARNING

THERMAL BURNS FROM CONTACT WITH HOT LIQUID, INHALATION AND EYE IRRITATION HAZARDS FROM HYDROGEN SULFIDE GAS

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FOOT OF CROWS MILL ROAD KEASBEY, N.J. C8832 (732) 738-4222

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When ordered to cross curb line we do so at your risk and will not be responsible for broken walks, driveways, etc.

CUSTOMER'S COPY

S.D.G. AGGREGATE, INC.

RECEIVED BY

ENCLOSURE 4

WASTE CHARACTERIZATION SAMPLE RESULTS AND WASTE DISPOSAL MANIFEST

| | PCB | DATA ANALYSIS SHEET | | SAMPLE NO. |
|-------------------------|--------------------|---------------------|----------|----------------------|
| | | 1B | | RR#1 |
| Lab Name: 21ST CEN | TURY ENVIRONMENTAL | Contract: | | |
| Project No.: | Site: | Location: | | Group: |
| Matrix: (soil/water) | Sall | | Lab S | ample ID: G8049 |
| Sample wt/vol: | 10 (g/mL) g | | L | ab File ID: D6160.D |
| Level: (low/med) | LDW | | Date | Received: 11/16/99 |
| % Moisture: 15 | | ansed: (Y/N); N | Date I | Extracted: 11/22/99_ |
| Concentrated Extract Vo | - | | | Analyzed: 11/23/99 |
| Injection Volume: | 2.0 (UL) | | Diluth | on Factor:1 |
| GPC Cleanup: (Y/N) | N | рН: | - | |
| CAS No. | Compound | MOL | Result n | ng/Kg Q |
| | AROCLOR 1016 | 0.29 | | U |
| | AROCLOR 1221 | 0.29 | | U |
| | AROCLOR 1232 | 0,29 | | U |
| ~ | AROCLOR 1242 | 0.29 | | U |
| | AROCLOR 1248 | 0.29 | 0.31 | |
| | AROCLOR 1254 | 0.29 | | U |
| | AROCLOR 1260 | 0,29 | 0.25 | J |

J = Detected below method detection limit

U=Not Detected

TO STEWE WEBER

| 322 P. 373 82 | 618 HERON DRIVE 60 | HAIN OF CUSTODY CUSTOMER: CORP ADDRESS: 200 FIDERZON (CONTRE TELEPHONE: 601 - 584 - 6 22 PROJECT: MICA PERTY PATROY PROJECT WARAGER: La BRECETIM K. Tayo PROJECT LOCATION: 9 STATE: A P.O. NUMBER: ADDITIONAL INFORMATION / SPECIAL INSTRUCTIONS | | | | | NO PORT | | DELIV TIER I | ERA / | ECI | s (P) | LEAS | E CIR | RES | EULTS | PLOUG | ONAL | TIER) / | | | | | | | |
|--|-----------------------|---|--------|------------|-------|-------|----------|----------------------|-----------------|-----------------|--------------|----------------------|-----------------------|---|---------|----------|---------------|----------------------|--|------------|------------|--------------|-------------|--------------|----------------|------|
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94128 Document Refer No. 98

WASTE MANAGEMENT OF PENNSYLVANIA, INC. 1121 Bordentown Road. Morrisville, PA 19067

(215) 736-9400

(215) 736-9475 Laboratory

| | NON-HAZARDOUS WASTE MANIFEST |
|-------|--|
| 1. | Generator of Waste (must be filled in by producer) EPA I.D. No. |
| | Company Name: (Print or Type) Ludio (Jp |
| | Pick-up Address fow Courty Blee. Proth Ask T |
| | Telephone Number: 405 215-1650 SIC No. |
| | Waste Stream Identification: This manifest represents a non-hazardous waste as per E.P.A. and PA.D.E.R. regulations. |
| 11. 4 | Tons: 20(-s-) Cubic Yards: Other (Specify); |
| | Name of Waste_ Agra-base seds |
| | Special Handling Instructions, if any: |
| | PROFILE/WASTE STREAM I.D. NUMBER: 363078 |
| to at | s to certify that the above named materials are properly classified, described, aged, marked, and labeled and are in proper condition for transportation according plicable state and federal law. The wastes were consigned to the transporter d. I certify that the foregoing is true and correct to the best of my knowledge. |
| ĸ | Signature: (Name) and The |
| 2. | |
| ۵. | Hauler of Waste (must be filled-in by hauler) EPA I.D. No. A/TU000613477 |
| 2. | Hauler of Waste (must be filled-in by hauler) EPA I.D. No. ATU000 613477 COMPANY NAME: MAPP, TAUXING COMP. |
| 2. | COMPANY NAME: MAPPI, TAUXING LAND. ADDRESS I MORRISTURA RA MATARIAN NAT 07747 |
| | COMPANY NAME: MAPO, TANKING COMP. |
| | COMPANY NAME: App. Truck No. 954 Vehicle Lic. No. 4977 Deck-up Date: 199 Truck No. 954 Vehicle Lic. No. 4977 Deck-up Date: 199 Truck No. 954 Vehicle Lic. No. 4977 Deck-up Date: 199 Deck-up Dat |
| | COMPANY NAME: Marature Rel Marature Na 1797 Pick-up Date: 199 Truck No. 954 Vehicle Lic. No. 1971 No. |
| 3. | COMPANY NAME: Marature Rd Metacan NA 17947 Pick-up Date: Alie 199 Truck No. 954 Vehicle Lic. No. 1977 No. 1999 The above described waste was picked up and hauled by me to the disposal facility and below and was accepted. I certify under penalty of perjury that the foregoing strue and correct agent and title: Disposer of Waste (must be filled in by disposer) CIRCLE ONE: 1.R.R.F. 1513 Bordentown Road Morrisville, PA 19067 Truck No. 954 Vehicle Lic. No. 1979 Vehicle Lic. N |

ENCLOSURE 5

REVISED DEED NOTIFICATION DECEMBER 7, 1999

Witco

Witco Corporation 1000 Convery Boulevard Perth Amboy, NJ 08862 (732) 826-6600 (732) 826-5408 Fax

December 7, 1999

Mr. Gary Lipsius
New Jersey Department of Environmental Protection
Division of Responsible Party Site Management
Bureau of State Case Management
401 East State Street
CN 028
Trenton, NJ 08625

SUBJECT: CERTIFICATION OF SUBMITTAL OF REVISED DEED NOTIFICATION CKWITCO CORPORATION, PERTH AMBOY PLANT CLEANUP

Dear Mr. Lipsius:

In accordance with the requirements for certification of reports per N.J.A.C. 7:26C-1-2, we submit the following, concerning the revised Deed Notification identifying those areas above NJDEP Residential criteria but below site cleanup standard for the Perth Amboy on site PCB remediation work.

"I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, to the best of my knowledge, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."







Page 2 December 7, 1999

> "I certify under penalty of law that I am fully aware of the requirements of N.J.S.A. 58:10B-3 et seq., as they pertain to remediation funding sources. Specifically, I am aware of my responsibilities in the establishment and maintenance of a remediation funding source. Additionally, I acknowledge that this remediation funding source shall be maintained until such time as I have submitted an alternative remediation funding source to the Department and it has been approved by the Department in writing or I have been notified by the Department in writing that I am no longer required to maintain a remediation funding source. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties."

CKWITCO CORPORATION

NOTARIZATION

CORINNE FITZSIMMONS NOTARY PUBLIC OF NEW JERSEY My Commission Expires April 15, 2003

Sincerely,

Richard Lissenden Plant Manager

CKWitco Corporation

DEED NOTICE

IN ACCORDANCE WITH N.J.S.A. 58:10B-13, THIS DOCUMENT IS TO BE RECORDED IN THE SAME MANNER AS ARE DEEDS AND OTHER INTERESTS IN REAL PROPERTY.

| | Prepared by: | * | |
|-------|---|-------------------------------|--------|
| | [Signature] | | |
| | [Print name below signature] | _ | |
| | Recorded by: | | |
| | [Signature, Officer of County Recording | Office] | |
| | [Print name below signature] | _ | • |
| | DEED NOTIC | CE | |
| | This Deed Notice is made as of the | day of,, by CI | KWitco |
| Corpo | oration (together with his/her/its/their succ | cessors and assigns, collecti | vely |
| "Own | ner"). | | |

WITNESSETH:

WHEREAS, Owner is the owner in fee simple of certain real property designated as the following Blocks and Lots; Block 471 Lot 1; Block 470, Lots 1.01 & 1.02; Block 472.03, Lots 1-13, & 30 & 32-35; and Block 474, Lot 1.01, on the tax map of the City of Perth Amboy, Middlesex County, New Jersey Department of Environmental Protection Known Contaminated Site List Number NJD002165561, more particularly described on Exhibit A attached hereto and made a part hereof (the "Property"); and

WHEREAS, the New Jersey Department of Environmental Protection ("Department") approved a remedial action on June 1, 1995 for NJD002165561/CKWitco Corporation Perth Amboy Site Convery Boulevard concerning the Property in which the Department has approved the use of institutional controls and/or engineering controls in accordance with N.J.S.A. 58:10B-13; and

WHEREAS, this Deed Notice itself is not intended to create any interest in real estate in favor of the Department, nor to create a lien against the Property, but merely is intended to provide record or deed notice of certain conditions and restrictions on the property and to reflect the regulatory and statutory obligations imposed as a condition of using institutional and/or engineering controls; and

WHEREAS, the areas described on Exhibit B attached hereto and made a part hereof (the "Affected Areas") contain contaminants above the applicable remediation standards that would allow for the unrestricted use of the Property; and

WHEREAS, the type, concentration and specific location of the contaminants are described on one or more diagrams, maps and/or tables on Exhibit B attached hereto and made a part hereof; and

WHEREAS, a narrative description of all institutional controls and associated monitoring and maintenance activities are provided in Exhibit C; and

WHEREAS, to prevent the potential for migration of the contaminants and unacceptable risk of exposure to the contamination to humans or the environment, permeable surface covers and asphalt covers are in place at the Property, at the locations shown in Exhibit B on maps titled Figure B-2.1, Figure B-2.2, Figure B-2.3, Figure B-2.4, Figure B-2.5 and Figure B-3; and

WHEREAS, to prevent the potential for unacceptable exposure to the contamination to humans or the environment a liner is in place at the Property, at the locations shown in Exhibit B on the map titled Figure B-2.1; and

WHEREAS, in accordance with the Department's approval of the Remedial Action Work Plan, and in consideration of the terms and conditions of that

approval, and other good and valuable consideration, Owner has agreed to subject the Property to certain statutory and regulatory requirements which impose restrictions upon the use of the Property, and to restrict certain activities at the Property, as set forth below.

NOW, THEREFORE, Owner agrees to the conditions and restrictions listed below and hereby notifies all interested parties, owners, lessees and operators that the applicable regulations and statutes require of such person while owning, leasing or operating the Property as follows:

1. RESTRICTED USES. The owner(s) of all or any fee interest in all or any portion of the Affected Areas and each operator of all or any portion of the Affected Areas, shall not allow any of the following uses of the following portions of the Affected Areas:

Portion of the Affected Area The Affected Engineering Control Area as identified in Exhibit B, Figures B-2.1, B-2.2, B-2.3, B-2.4, B-2.5 and B-3.

The Other Affected Areas as identified in Exhibit B, Figure B-3.

Restricted Use

The use shall be restricted to: non-residential uses only and pursuant to Paragraphs 2 and 3.

2. EMERGENCIES. In the event of an emergency which presents a significant risk to public health, safety, or the environment, the application of

Paragraph 1 above may be temporarily and unilaterally suspended, by Owner, provided that the Owner:

- i. Immediately notifies the Department of the emergency;
- ii. Limits both the actual disturbance and the time needed for the disturbance to the minimum reasonably necessary to adequately respond to the emergency;
- iii. Implements all measures necessary to limit actual or potential, present or future risk of exposure to humans or the environment to the residual contamination; and
- iv. Restores the Affected Areas to the pre-emergency conditions to the extent reasonably possible, and provides a report to the Department of such emergency and restoration efforts within ninety (90) calendar days after the end of the emergency.
 - 3. ALTERATIONS, IMPROVEMENTS, AND DISTURBANCES.
- (a) Except as provided in Paragraph 2 above, no owner or operator shall make, or allow to be made, any alteration, improvement, or disturbance in, to, or about the Affected Areas which disturbs any engineering control or which creates an unacceptable risk of exposure of humans or the environment to contamination in the Affected Areas without first obtaining the express written consent of the Department. Nothing herein shall constitute a wavier of the Owner's or operator's obligation to comply with all applicable laws and regulations.

- (b) Notwithstanding subparagraph 3(a) above, the Department's consent is not required for any alteration, improvement, or disturbance provided the Owner or operator;
- i. Provides for restoration of any disturbance of an engineering control to pre-disturbance conditions within sixty (60) calendar days after the initiation of the alteration, improvement or disturbance; and
- ii. Does not allow an exposure level above those noted under Restricted Uses, provided that all applicable worker health and safety laws and regulations are followed during the alteration, improvement, or disturbance.
- 4. ACCESS. While this Deed Notice is in effect, the Owner agrees to allow the Department, its agents and representatives access to the property to inspect and evaluate the continued effectiveness of the institutional or engineering controls and to conduct additional remediation to ensure the protection of the public health and safety and the environment.
- 5. NOTICE TO LESSEES AND OTHER HOLDERS OF PROPERTY
 INTERESTS. Owner shall cause all leases, grants, and other written transfers of
 interest in the Affected Areas to contain a provision expressly requiring all holders
 thereof to take the Property subject to the restrictions contained herein and to
 comply with all, and not to violate any of the conditions of this Deed Notice.

 Nothing contained in this Paragraph shall be construed as limiting any obligation

of Owner to provide any notice required by any law, regulation, or order of any governmental authority.

- 6. ENFORCEMENT OF VIOLATIONS. The restrictions provided herein may be enforceable solely by the Department against any person who violates this Deed Notice. A violation of this Deed Notice shall not affect the status of the ownership of or title to the Property. To enforce violations of this Deed Notice, the Department may initiate one or more enforcement actions pursuant to N.J.S.A. 58:10-23.11u and, require additional remediation and assess damages pursuant to N.J.S.A. 58:10-23.11g.
- 7. SEVERABILITY. If any court of competent jurisdiction determines that any provision of this Deed Notice is invalid or unenforceable, such provision shall be deemed to have been modified automatically to conform to the requirements for validity and enforceability as determined by such court. In the event that the provision invalidated is of such a nature that this provision cannot be so modified, the provision shall be deemed deleted from this instrument as though it had never been included herein. In either case, the remaining provisions of this Deed Notice shall remain in full force and effect.
- 8. SUCCESSORS AND ASSIGNS. This Deed Notice shall be binding upon Owner and upon Owner's successors and assigns while each is an owner or operator of the Property, and the Department.

9. REQUIREMENT OF NOTIFICATION. The Owner shall notify any person who intends to excavate on the property of the nature and location of any contamination existing on the property and of any conditions or measures necessary to prevent exposure to contaminants.

10. TERMINATION AND MODIFICATION

- (a) This Deed Notice shall terminate only upon filing of an instrument, executed by the Department, in the office of the County Clerk/Register of Deeds and Mortgages of Middlesex County, New Jersey, expressly terminating this Deed Notice.
- (b) Any person may request in writing at any time that the Department modify or terminate this Deed Notice or initiate termination proceedings based on, for example, a proposal that the Property does not pose an unacceptable risk to : public health and safety or the environment. Within ninety (90) calendar days after receiving such a request the Department will either:
 - i. Approve the request and have the Owner:
- Record with the office of the county recording officer a notice executed by the Department that the use of the Property is no longer restricted and the Deed Notice is terminated or record a modified Deed Notice delineating the new restrictions; and

-Provide written notice to each municipality in which the Property is located, with a copy to the Department, of the removal or change of the restrictions contained herein; or

- ii. Issue a written notification of intent to deny the request pursuant to (c) below.
- (c) The Department will set forth in a notice of intent to deny a request to modify or terminate this Deed Notice the basis for its decision. The owner can respond to the intent to deny by providing new or additional information or data. The Department will review any such new or additional information or data and issue a final decision to grant or deny the request within sixty (60) calendar days after the Department's receipt of the owner's response.

IN WITNESS WHEREOF, Owner has executed this Deed Notice as of the date first written above.

| ATTEST: | CKWitco Corporation |
|------------------------------|--|
| | Ву |
| | |
| | corporation] W JERSEY SS.: MIDDLESEX that on , 19 , [Name of person executing document on behalf of ally came before me, and this person acknowledged under oath, to |
| | erson is the [secretary/assistant secretary] of [Owner], the med in this document; |
| ` ' | person is the attesting witness to the signing of this document by the te officer who is the [president/vice president] of the corporation; |
| , , | locument was signed and delivered by the corporation as its nd was duly authorized; |
| (d) this p to this docume | erson knows the proper seal of the corporation which was affixed nt; and |
| (e) this p | person signed this proof to attest to the truth of these facts. |
| | [Print name and title of attesting witness] |
| *. | Signed and sworn before me on , 19 |
| | , Notary Public [Print name and title] |

EXHIBIT A

METES AND BOUNDS DESCRIPTION OF PROPERTY

<u>Notes</u>

- 1. See attached Figure A-1, United States Geological Survey Quadrangle Map, for regional location.
- 2. See attached Figure A-2, Hagstrom County Map, for site location.
- 3. See attached tax maps for metes and bounds description of property.

EXHIBIT B

DESCRIPTION OF AFFECTED AREAS

Note: See attached figures and accompanying notes, including Figure B-1, which serves as a base map for referencing the orientation of Figures B-2.1 through B-2.5 in relation to the Facility and each other, and Figure B-3.

EXHIBIT C

INSTITUTIONAL CONTROLS AND ASSOCIATED MONITORING AND MAINTENANCE ACTIVITIES

There are two types of affected areas identified in the Deed Notice, Affected Engineering Control Areas and Other Areas. Affected Engineering Control Areashave engineering controls in place. The controls consist of a minimum of 2 feet of clean soil cover in the contaminated areas (Figures B-2.1 through B-2.5). In the heater pad area, the clean soil is separated from the contaminated soil at the bottom of the excavation by a PVC liner. At two locations depicted on Figure B-3, asphalt covers have been installed to control exposure to contaminated soil. Other Areas depicted on Figure B-3 have contamination in soil above residential remediation standards but below the remediation standard for the Property. The Other Areas do not have engineering controls in place and exposure will be controlled through use of institutional controls with associated monitoring and maintenance activities.

Any work performed in the contaminated areas designated on Figures B-2.1 through B-2.5 and Figure B-3 will be performed under the guidance of both a health and safety plan and a work plan. These plans will address issues such as personal protective equipment, sampling of excavated material, real-time air monitoring, management of contaminated spoils, erosion control, and site restoration.

The clean soil cover was hydroseeded after installation and the resulting vegetative layer is inspected and maintained regularly. If erosion or loss of cover soil occurs, CKWitco Corporation will replace the soil to maintain the minimum 2-foot thick cover and revegetate to prevent erosion.

CKWitco Corporation operations personnel periodically inspect water collection standpipes in the heater pad area and pump accumulated liquids, as necessary. Cracks or other damage to the concrete caps in the heater pad area will be repaired if they are observed by Facility personnel. In addition, CKWitco Corporation